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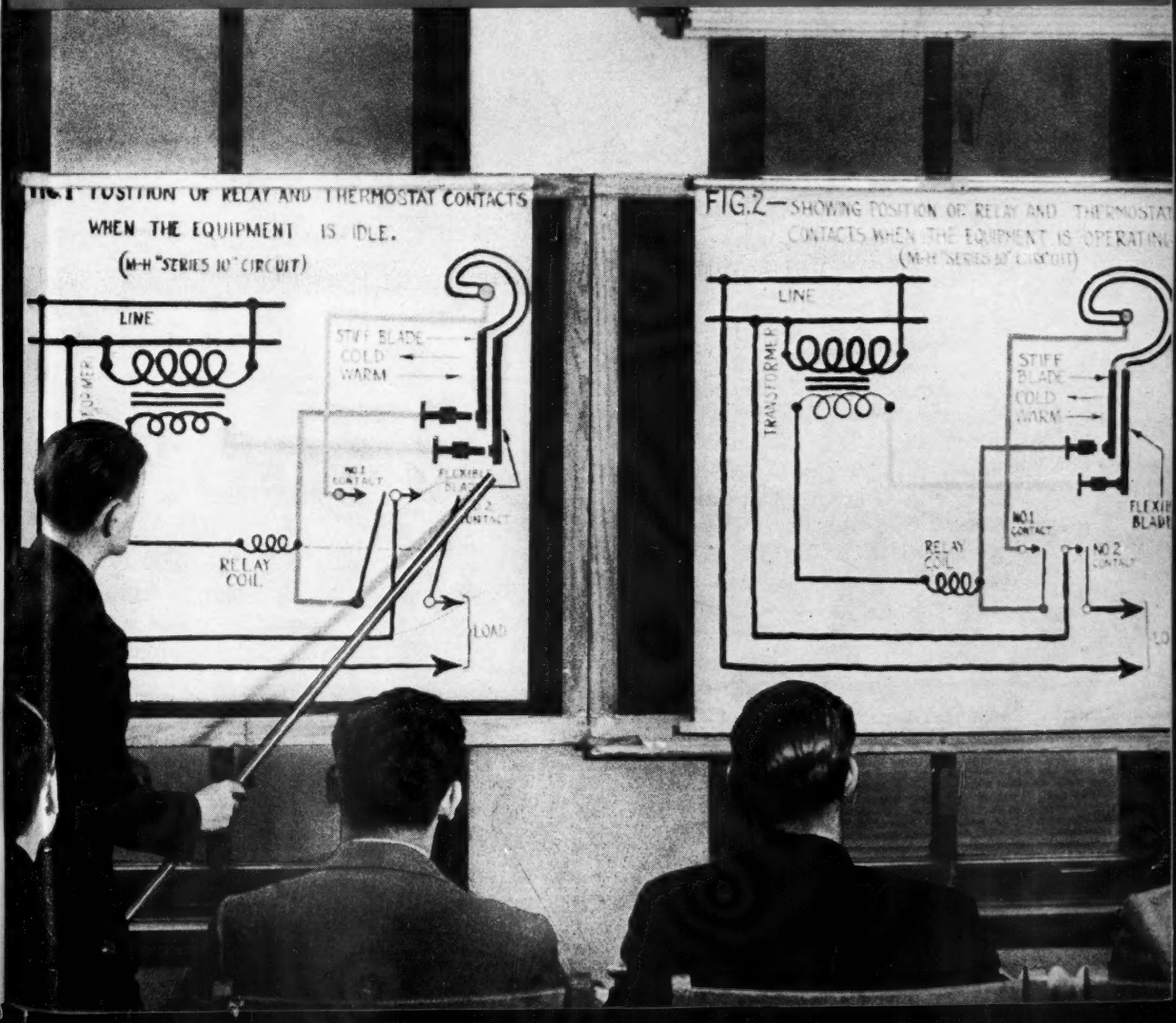

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• It is estimated that through the efficient routing of tank trucks during the war period, Fuel Oil Marketers have been able to effect a 33% saving in mileage, not to mention the saving in manhours, manpower and equipment. This has resulted in a lower delivery cost and a greater profit per gallon delivered. In the effecting of this economy, Brodie Meters have contributed a large share. Not only that, but on loading racks as well as Tank Trucks, Brodie Meters have eliminated countless errors and losses which otherwise could never have been located or corrected. In order to keep operating costs down, now and in the future, adopt Brodie Meters . . . and dispatch your trucks from metered loading racks on a one-way route of scheduled deliveries.

WRITE FOR FULL DETAILS TODAY.

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PETROLEUM METERING EXCLUSIVELY

SINCE 1927

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Names in the News

O. E. Nesmith, formerly chief engineer of the Williams Oil-O-Matic Heating Corp., has been made Director of Engineering for the Eureka Vacuum Cleaner Company. Chief engineers of the Eureka and the Oil-O-Matic divisions of the company will work under his direction. Mr. Nesmith started in 1920 as a mechanic in the garage of C. U. Williams & Son, Bloomington, Ill., turning to oilburner service when the company entered the industry. As director of installation and service instruction for the company he was responsible for the introduction of American methods of oilburning into Europe.

Glenn Arnold, resident vice-president of the Petroleum Heat & Power Company at Boston, died suddenly following a heart attack on July 20. He was born in Harrison Valley, Pa., in 1893. During his career in the oilheating industry he was prominent in association activities, and was vice-president of the Independent Oil Men's Association of New England at the time of his death.

Stephen L. Ochoa has become chief engineer of the Boiler Division of the Ames Iron Works Division of Pierce Butler Radiator Corp., Oswego, N. Y. Mr. Ochoa formerly was connected with York-Shipley, joining the York organization in the fall of 1934 and remaining until the spring of 1940. Since 1942 he has been plant supervisor for J. R. Harper, Inc., Charlottesville, Va., manufacturing material for the Navy and Maritime Commission.

fueloil & oil heat

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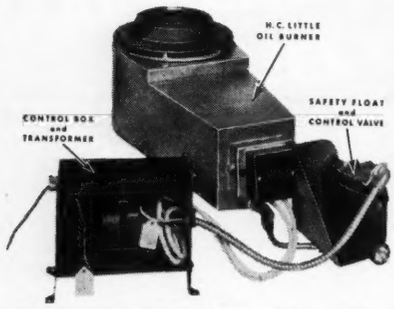
This H. C. LITTLE Oil Burner



Can be worth its weight in Gold to You Each Year

THIS ELECTRIC IGNITER IS WHAT MAKES ALL THE DIFFERENCE....

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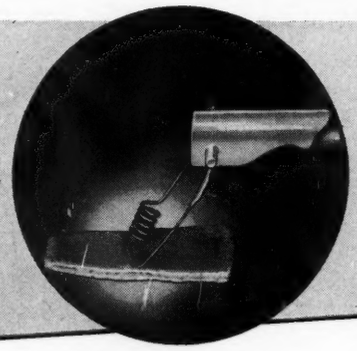
—IN USER SATISFACTION



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It can be adjusted to small-home heat requirements of two to three quarts an hour and will operate at the required output with high efficiency (10% to 12% CO_2), with a resulting oil consumption that is remarkably low as compared to a pressure type burner having a MINIMUM satisfactory consumption of a gallon an hour. Add to this the fact that no other complete line of oil-fired, vaporizing equipment offers automatic operation with ELECTRIC IGNITION, thermostatically controlled, and you can visualize the profit possibilities with H. C. Little equipment.

WRITE FOR A COPY OF "How to Get Real Profits in Postwar Heating". You'll discover how the H. C. Little burner can be worth its weight in gold to you each year.

LITTLE OIL BURNER

H. C. Little **BURNER CO.**

The Greatest Name in Low-Cost Automatic Oil Heat for Small Homes

Dept. 8, San Rafael, Calif. Branch Offices from Coast to Coast

Charles H. Rystrom has formed the Rystrom Engineering Co., Rockford, Ill., to manufacture a complete line of fuel pumps and pump units for pressure atomizing oilburners. Mr. Rystrom formerly was manager of the pump division of the Sundstrand Machine Tool Co., Rockford, which position he resigned to form the new company of which he is president and general manager. It is intended to expand the line to include hydraulic pumps, fluid motors and controls for industrial and aircraft applications. Development of the oilburner pumps has been completed and units now are ready for the trade.

Perl S. Miller, president of the former Lamneck Products, Inc., died after a sudden heart attack at his home in Columbus, Ohio, July 3. Mr. Miller was active in the affairs of the National Warm Air Heating & Air Conditioning Association, and a member of the Board of Directors until his resignation due to ill health about two years ago.

Walter L. Bernard has been elected president and general manager of Sid Harvey of Penna., Inc., Philadelphia. This company is affiliated with Sid Harvey, Inc., Valley Stream, N. Y., and is owned by the same interests, according to Sid Harvey, president. The new company is intended to give Philadelphia customers better and faster service on oilburner supplies and repair parts. Mr. Bernard resigned as treasurer and sales manager of Sid Harvey, Inc., where he has been continuously employed for the last 14 years. Other officers are Sid Harvey, chairman, and Lawrence Harvey, vice-president.

Ralph L. Erlewine has been promoted by Penn Boiler & Burner Mfg. Corp., Lancaster, Pa., to the post of treasurer. *Charles F. Hoffer* has joined the firm to handle advertising and sales promotion of Penn Packaged Heat.

DEALERS are LOOKING

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TEESDALE T. U. X. PUMP

The Heart-Beat of the Burner's Oil Flow

- SILENT and LEAK-PROOF
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CAPACITY:
30 gallons per hour

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- PRECISION ACTION
- EXTRA SIMPLE
- TROUBLE-FREE
- PASSED BY THE UNDERWRITERS

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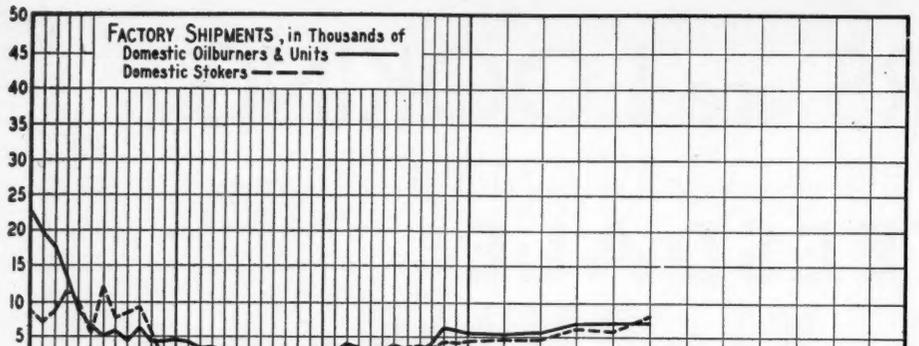

FACTORY SHIPMENTS, in Thousands of
Domestic Oilburners & Units
Domestic Stokers
DEC APR AUG DEC APR AUG DEC APR AUG DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1942 1943 1944 1945

Shipments of Oilburners and Units

Adjusted to include manufacturers other than the 101 reporting to Census Bureau, FUELOIL & OIL HEAT's estimates of shipments are:

	MAY			FIVE MONTHS		
	1945	*1944*	*Percent Change*	*1945*	*1944*	*Percent Change*
Conversion	5,672	2,337	+142.6	24,899	12,905	+ 92.9
Boiler units	390	501	— 22.2	3,524	1,686	+108.9
Furnace units	1,059	288	+267.3	3,684	1,628	+126.2
All domestic	7,121	3,126	+127.8	32,107	16,219	+ 97.9
Commercial	3,421	2,111	+ 62.1	16,548	13,723	+ 20.6
Total	10,542	5,237	+101.4	48,655	29,942	+ 62.5

STOCKS OF DOMESTIC OILBURNERS AND UNITS
(in Thousands) End of Month Shown
Factory Stocks
Dealer Stocks
9 8 7 9 7 9
6 5 7 7 6
JUN SEP DEC APR AUG DEC APR AUG DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1942 1943 1944 1945

June Minimum Retail Prices: Key Dealers

	CONVERSION BURNERS		BOILER-BURNERS		FURNACE-BURNERS	
	*Top price**	*Low price*	*Top price**	*Low price*	*Top price**	*Low price*
Highest	$373	$195	$800	...	$525	...
Lowest	200	165	400	...	405	...
June Aver.	268	179	507	...	474	...
May Aver.	269	178	513	...	486	...

*Top price key dealers for conversion burners are those whose minimum retail prices are $200 or more, for boiler-burner and furnace-burner units (exclusive of ductwork) those whose minimums are $400 or over.

Price Index: Conversion Burners: January 1940 is 100%

WHOLESALE				RETAIL			
June	111.2	Six months ago	114.8	June	114.1	Six months ago	113.0
May	115.6	Year ago	115.0	May	114.3	Year ago	114.0

INDEX OF BURNER PERMITS in 43 Cities
(Average of 1936-7-8=100)
INDEX OF NEW HOME PERMITS in 35 Cities
(Average of 1936-7-8=100)
Both indexes adjusted for seasonal variation
37.3 49.2 44.8 41.7 43.4 67.3
19.0 21.9 25.9 22.6 22.6 19.9
DEC APR AUG DEC APR AUG DEC APR AUG DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1942 1943 1944 1945

Oilheating Trends

ESTIMATED INSTALLATIONS of domestic oilburners and units in June were 3,220, up 93.6% from the same month in 1944. The average sized dealer was able to immediately install as a replacement any suitable burner he could lay hands on. Sales of reporting dealers were divided: 60% conversion burners, 26% boiler-burner units and 14% furnace-burner units. Total installations for the half year were 30,565, a gain of 76.9% over last year with 17,289.

BURNER STOCKS: Dealer stocks of domestic burners and units on July 1 were approximately 8,600, moderately up from the previous month as factory shipments started to move in a little better volume. Factory stocks on May 31, the latest available data, were 6,136, compared with 6,574 a month previous. Factory shipments during May were 6,409 domestic and 3,079 commercial burners.

SERVICE INCOME: Average service department income for June of reporting dealers was $2,907, up 56% from $1,856 for the same group the year before. May service income was $2,221 and April $3,295. The June upswing, predicted in last month's issue, reflects summer service work getting under way.

SERVICE PARTS SHORTAGES: A check of parts scarcities this month shows some improvement in motors and pumps over the last previous check, made in February, while controls and transformers are harder to get now than five months ago. The per cent of reporting dealers having serious difficulty getting principal parts in February and July shows:

	February	*July*
Motors	70%	47%
Pumps	49	37
Controls	39	44
Transformers	18	19

Other principal parts scarcities, with the per cent of dealers reporting difficulty are: Nozzles 16%; Pump repairs 7%; Motor repairs 6%; Fuel tanks 5%. Scarcities listed by less than 5% of dealers are starting switches, clock thermostats, circulators, electrodes, relays, low water controls, magnetic oil valves, oil filters and electrical parts.

SERVICE MANPOWER: The average reporting dealer now has 4.1 burner service men, or one to each 502 service customers on his books. They feel that they need for fall an average of 5.6 men to handle the

work in sight, or one man to each 367 customers. If they are successful in getting these men, they will be in better shape than at any time since the fall of 1942, when they had one man to each 337 customers. Optimistic about getting the desired extra men are 39% of those reporting, with the other 61% expecting little or no success in the search.

COUPONS AND FILL-UPS: In some of the larger Eastern centers, especially the metropolitan areas of New York and Boston, coupons are very slow in reaching customers who sent in their applications at the first opportunity, or in early June. The principal reason for this is that coupon issuance is out of the hands of local boards and being handled by area distribution centers. These centers handle coupons for various rationed commodities and they are very short of manpower. In some spots local industry associations are supplying volunteers to help with the issuance. At the time these monthly reports were mailed, or about July 5, coupons had been received by 20% of customers, countrywide. But dealers by that date had received summer fill-up orders, including keep-filled accounts, representing 39% of all users. Asked about what per cent of all customer tanks they expected to be able to fill before the heating season starts, the composite answer is 69%. If this is accomplished, it will be a better fill-up job than was done last season, when only 58% got their initial drop before October first.

DEALER STORAGE: Reporting fueloil distributors, as of July 1, had bulk storage capacity 42% filled on distillates and 22% filled on kerosene. This applies to District I. Answers to this question from other sections were not enough to be representative.

DEALER COMMENTS: Typical comments of the month were . . . "There is more manpower available, but it's not the right kind, and one must keep shifting around until something suitable is found" . . . "We have the largest potential market for burners in our business history" . . . "If we don't get burners for replacements before fall we will lose many old-time valued customers to gas."

◈

ONE OF THE DEALERS reporting this month for the "Trends" section asked, "Will you hazard a guess when fueloil will become unrationed relative to V-J Day"? While any answer to such a question can only be a guess, since Government as yet has no definite answer, it is reasonable to believe that rationing could and would be discontinued within ninety days after Japanese hostilities cease.

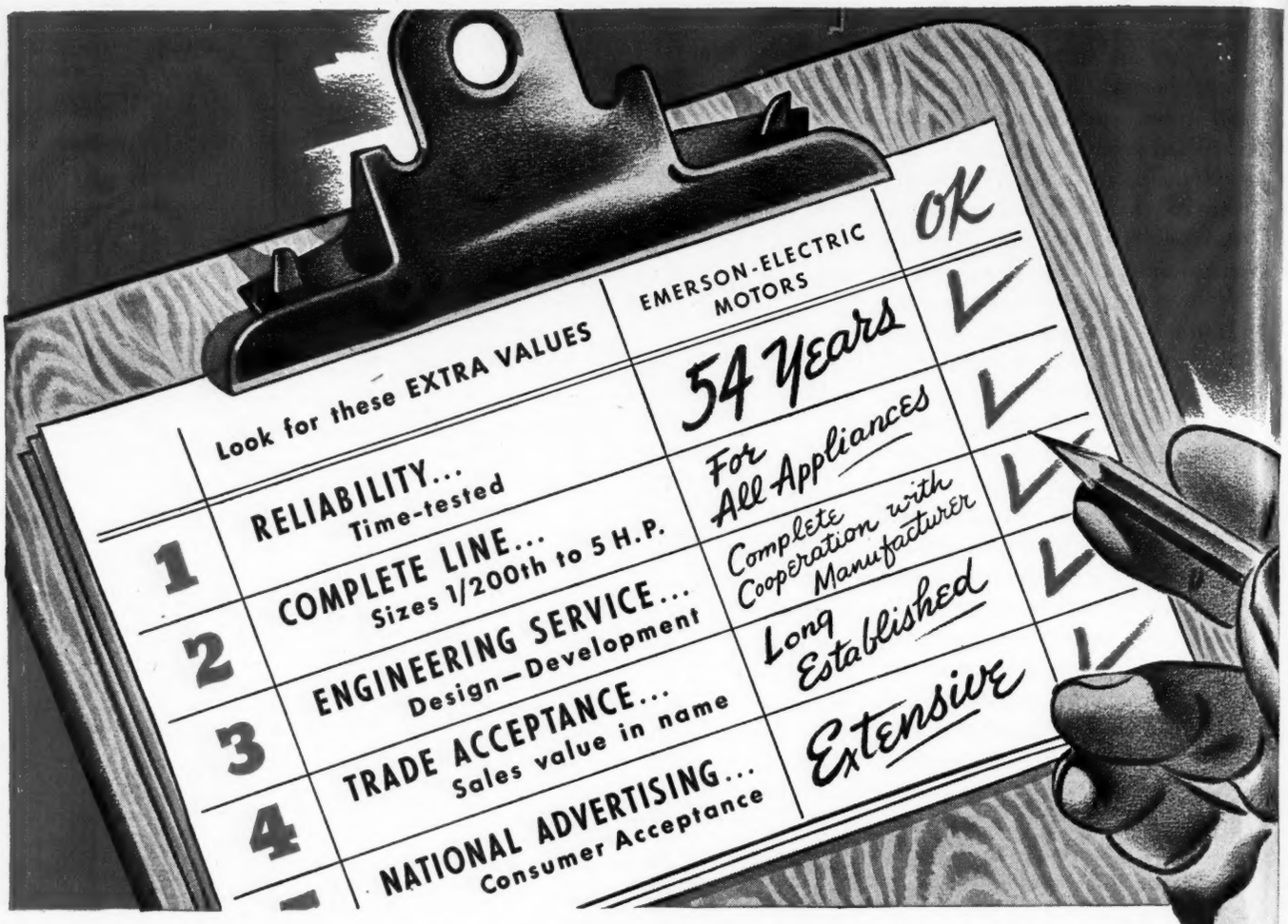
The time lag will probably be more a matter of redistributing transportation facilities than product shortage. Naturally, large amounts of fueloil, particularly residuals, will be needed for ship movement to get the millions of fighting men back home, but this can't possibly be as great a demand as the total now being used in active warfare. True, some light products will have to be supplied to Europe, but present refinery output is so large that it now looks like we could comfortably care for all of those off-shore needs and still give civilians what they want after a short time lag.

It is important to remember that present civilian use of fueloil is larger than before the war. Rationing has cut heating fuel use by at least 25%, perhaps more, but other uses, such as industrial and agricultural demands, have not been cut. In fact, they have grown to the point where the overall civilian demand is at new peaks. With cancellation of war contracts industrial use will drop sharply almost overnight, making more oil quickly available for heating.

Oilburner* and Building Permits

OILBURNERS					DWELLINGS			
June		6 MONTHS			June		6 MONTHS	
1945	1944	1945	1944		1945	1944	1945	1944
11	..	..	..	Albany, New York	..	..	..	..
..	..	..	..	Baltimore, Maryland	14	77	43	78
..	..	..	..	Binghamton, New York	10	0	11	1
..	..	..	..	Bloomfield, N. J.	14	..	..	..
75	68	..	..	Boston, Massachusetts	..	..	..	..
14	14	80	41	Bridgeport, Conn.	..	..	..	..
..	..	..	..	Buffalo, New York	13	..	..	..
..	..	..	..	Des Moines, Iowa	7	1	11	2
13	4	..	106	Detroit, Michigan	701	297	..	1853
5	3	21	9	Elizabeth, N. J.	0	..	..	..
3	2	27	29	Freeport, New York	..	..	..	..
..	..	..	..	Greenwich, Conn.	0	0	1	1
..	..	..	..	Hackensack, N. J.	42	0	44	0
15	0	68	..	Hartford, Conn.	..	..	..	..
5	0	19	1	Irvington, N. J.	0	0	0	4
..	..	..	..	Lynn, Massachusetts	1	0	2	0
6	1	..	15	Milwaukee, Wisc.	..	..	..	..
10	6	84	78	Minneapolis, Minn.	61	1	248	3
0	3	13	16	Montclair, N. J.	..	..	..	..
7	15	..	51	Mt. Vernon, New York	..	..	..	..
31	11	157	78	New Bedford, Mass.	..	..	..	..
1	2	20	5	New Haven, Conn.	..	..	..	..
0	1	0	2	New Orleans, La.	..	..	..	..
1	2	71	..	New Rochelle, N. Y.	0	0	0	1
4	1	..	10	Norfolk, Virginia	7	0	..	4
0	0	2	1	Oakland, Calif.	..	..	..	..
8	11	46	61	Omaha, Nebraska	19	17	125	267
5	0	8	0	Orange, New Jersey	0	0	0	0
15	1	42	10	Paterson, N. J.	0	0	..	1
..	..	..	..	Plainfield, N. J.	5	0	5	7
9	0	40	11	Portland, Maine	1	0	..	1
30	8	214	59	Portland, Oregon	74	28	234	367
12	3	48	..	Providence, R. I.	4	0	4	0
..	..	..	..	Reading, Penna.	6	0	7	0
2	0	4	0	Richmond, Virginia	37	116	322	189
0	0	8	0	Rochester, N. Y.	..	..	..	..
4	1	24	16	Rockville Center, N. Y.	0	0	0	0
0	0	14	0	Salem, Massachusetts	0	0	0	0
6	6	52	33	St. Louis, Misouri	0	0	0	0
12	4	61	28	St. Paul, Minnesota	..	..	..	..
..	..	..	..	Seattle, Washington	137	122	705	734
..	..	..	..	Springfield, Mass.	5	4	16	10
4	0	27	..	Stamford, Conn.	..	..	..	..
..	..	..	..	Syracuse, New York	11	0	55	21
..	..	..	..	Trenton, New Jersey	0	5	3	6
..	..	..	..	Utica, New York	2	1	3	1
15	16	127	61	Washington, D. C.	..	..	..	..
..	..	..	..	West Orange, N. J.	1	0	3	0
11	5	37	19	White Plains, N. Y.	0	0	1	0
4	4	12	9	Wilmington, Delaware	0	0	0	8
8	31	96	78	Worcester, Mass.	..	..	..	..
4	9	..	46	Yonkers, New York	..	..	..	..
339	232	1208	645	*Totals*	1146	669	1844	1700
+46.2		+87.2		*Percent Change*	+67.0		+8.5	

*Permits are not total sales in each market since none are reported from suburban areas, which normally account for 20% to 60% of total sales in each market; nor are they an accurate index where enforcement is lax. Rightly used, however, they are a useful working index.



Before You Buy Electric Motors

Check These 5 Vital Values

Because a motor is the vital link between product design and product performance, it is always wise to look for the *extra values* back of the motor itself. . . . Five important background values in Emerson-Electric Motors are high-lighted in the chart above. It will pay you well to investigate them carefully—because, no matter how good your product may be, it is finally no better than the motor that drives it.

ENGINEERING SERVICE—Design—Development. . . . For years past Emerson-Electric has been closely associated with many manufacturers in the practical development of new motor-driven products. This service is of even greater value today, because it embraces a vastly expanded experience.

INVESTIGATE *the extra values* back of Emerson-Electric Motors. Give your products this *extra sales value.*

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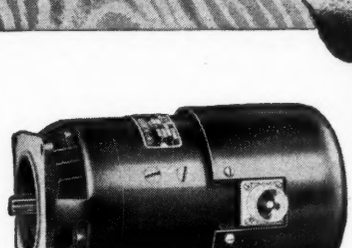


Electric motors for Aircraft and power-operated gun turrets are being made by Emerson-Electric for service on all the battle fronts.

Airplane Gun Turret for Army Bomber—one of six types manufactured by Emerson-Electric.

ARMY E NAVY

EMERSON ELECTRIC

MOTORS · FANS — APPLIANCES

Consumers Talk About Fuels

Part I: Effect of Wartime Shortages; Fuel Cost Opinions

by
Robert Gray

This is the first of a series of three articles explaining what reporters for FUELOIL & OIL HEAT *learned by talking with 1,438 families in 20 cities. Many questions were asked and the answers recorded, grouped roughly into four basic determinations: the effect of wartime difficulties on public acceptance of oilheating; types of heating and fuels now used in the principal oilheating areas, and the degree of satisfaction with these fuels; fuel preferences and reasons for these preferences; immediate postwar buying intentions.*

This first article gives the basic or foundation data to which the opinions can be related, an impression of wartime difficulties and their probable long-range effect, and fuel cost opinions. The second section, to appear in the September issue, will cover fuel preferences and postwar intentions; the final installment, in the October issue, will be devoted to reasons for liking or disliking the fuel now used, and in cases of dissatisfaction, why they think some other fuel would be better.

DURING THE PAST YEAR there have been a number of forecasts of postwar oilheating activity by major oil companies and some of the larger oilburner manufacturers. They all point to considerable expansion in burner sales and fueloil demand, compared with prewar years.

But in making these predictions, their economists had no thought that these sales would be easy to make, that buyers would come into dealers' showrooms and demand burners. They did base their forecasts on the belief that industry men would be alert to marketing problems as they arose, and take the necessary steps to solve them.

During the past three or four years we have given little or no attention to selling; we've been too busy with war activities. Within that time some things may have happened, possibly caused by the war, that will affect our postwar sales results. More likely, some things that started to happen before the war, and seemed of little consequence then, may have become important during the years when we were otherwise occupied.

It was with this thought in mind that FUELOIL & OIL HEAT decided to conduct a consumer interview survey. Perhaps some of the selling problems we are to bump into just after V-J Day could be seen in advance, and preparation made to be ready for them.

From the completed returns we did get some surprises. There has been some impairment of the public's liking for oilheating as a result of wartime troubles. A lot of our good citizens are not sure about long range oil supply, after all they have read in the magazines . . . articles written to sell a bill of goods, a rise in the price of crude.

An amazing percent of families now burning coal want to get away from it as quickly as circumstances permit, and this includes stokers as well as handfired. On the other hand, gas preference is stronger than we had expected, considering the rather limited number of present gas users.

Survey Methods Used

Before getting into the detail of the survey, we should explain how we got these impressions. The principal questions that we wanted to investigate were explained to two specialists in public opinion sampling. It was determined that, since we wanted principally opinions rather than numerical measurements, and since we were interested only in the active oilheating areas of the country, about 1,500 interviews would be enough if they were well selected. Twenty cities were carefully chosen, with 75 interviews planned for each. These were to be divided into five neighborhoods in each city, with 15 interviews each.

Because 85% of all oilheating is in urban centers of 50,000 or more population, we chose 17 cities above that figure and three below. In New England the cities used were Portland, Boston, Springfield and Meriden. Eight were in the Middle Atlantic States: Rochester, White Plains, Jamaica, Newark, Trenton, Philadelphia, York and Baltimore. Six in the Middle West were Detroit, Evanston and Cicero, Ill., (Chicago suburbs), Milwaukee, Waterloo and St. Louis. In the Pacific Northwest there were two, Portland and Seattle.

In prewar days, 62% of oilheating users were in middle-income brackets, with the balance divided equally between high and low. So the five neighborhoods were selected: one definitely above $5,000 incomes, one with people of less than $2,500 incomes and the other three with estimated incomes between $2,500 and $5,000. The three middle-income neighborhoods were then divided: one with average old homes; one with mostly new homes, such as a recent prewar builder development, and the third to represent the city's predominant foreign or racial element, such as Polish in Milwaukee, German in St. Louis, Jewish in Jamaica, etc.

Once in the neighborhood, the reporter called at every fourth house, talked to the wife or husband, until the 15 interviews were completed. A four-page questionnaire was used to guide the interview and the answers written in as given.

Local Industry Help

The undertaking would have been much more difficult but for the generous cooperation of an industry man in each city who supervised the work. Familiar with local conditions, they selected the neighborhoods to fit the pattern, located and hired on our behalf a suitable re-

porter, and in general saw that the work was well done.*

Oilheating users were found to have the largest average home sizes, with gas users next. Gasheated homes are larger than the average size of all homes. It is also significant that families who want gas, but are not now using it, have homes of larger than average size. (This will be amplified in the second article). Sizes of gas heated and gas-preferred homes, as indicated in this survey, offer an interesting sidelight on the oft-repeated statement among oil men that gas will be strongest in small compact houses, to minimize the effect of high fuel cost.

From the thinking of the public today, gas is and will be stronger in larger homes because they are occupied by people with more money to spend.

Average home sizes by rooms, by type of fuel being used and by sections are shown in Table I.

TABLE I

Homes Sizes and Fuels

	Coal	*Oil*	*Gas*	*All*
New England	7.4	8.3	6.5	7.8
Mid-Atlantic	6.6	8.0	8.5	7.3
Middle West	6.1	7.3	6.7	6.4
Pacific N.W.	5.4	6.8	7.1	6.4
All Sections	6.5	7.8	7.2	7.0

In contrast to other fuels, oilheating as now installed favors boiler type heating plants over warm air. This was found to be true even in the Midwest cities, where warm air is most widely accepted.

Based on all 20 cities studied, oilheating was divided: 66% boiler plants, 34% warm air. Coal heating showed 47% boiler, 53% warm air; gasheating had 38% boiler, 62% warm air. Curiously, only 4% of all heating plants encountered were winter airconditioning; these are included in the warm air percentages just stated. It should be recalled that this survey is not intended to be representative of the country as a whole, but rather of the areas and income levels where oilheating actively competes with other fuels . . . in other words, typical of our postwar market.

Table II shows the number and type of heating plants encountered, using each fuel.

TABLE II

Number of Heating Plants by Fuels

	Coal	*Oil*	*Gas*	*Total*	*Total*
New England					
Steam	61	65	6	132	48%
Hot Water	16	44	5	65	24
Warm Air	39	22	6	67	24
Winter AC	..	7	3	10	4
Total Fuel	116	138	20	274	
% Each Fuel	42	51	7		
Mid-Atlantic					
Steam	84	111	7	202	35
Hot Water	98	87	12	197	34
Warm Air	108	54	8	170	30
Winter AC	..	1	2	3	1
Total Fuel	290	253	29	572	
% Each Fuel	51	44	5		
Middle West					
Steam	10	5	3	18	4
Hot Water	86	50	4	140	32
Warm Air	189	37	25	251	56
Winter AC	5	16	13	34	8
Total Fuel	290	108	45	443	
% Each Fuel	66	24	10		
Pacific N.W.					
Steam	2	..	1	3	2
Hot Water	1	10	..	11	7
Warm Air	54	57	7	118	80
Winter AC	5	11	1	17	11
Total Fuel	62	78	9	149	
% Each Fuel	42	52	6		
All Sections					
Steam	157	181	17	355	25
Hot Water	201	191	21	413	29
Warm Air	390	170	46	606	42
Winter AC	10	35	19	64	4
Total Fuel	758	577	103	1438	
% Each Fuel	53	40	7		

The average oilheating user interviewed has had 7.5 years experience with the fuel. As a coincidence, the average burner age encountered was also 7.5 years, indicating that people who moved into homes that already had oilheating are just balanced by those who have replaced ancient oilburners with new ones. The average gasheating user had had just five years' experience, but since only 103 gasheated homes were encountered, not too much significance should be given this figure. Table III shows by sections the average years oil and gasheating have been used and the average oilburner age.

TABLE III

Years' Experience With Fuels

	OIL		GAS
	Years Used	*Burner Age*	*Years Used*
New England	8.4	7.9	6.1
Mid-Atlantic	6.5	6.7	5.8
Middle West	8.7	7.6	4.0
Pacific N.W.	7.6	8.1	6.3
All Sections	7.5	7.5	5.0

There is some evidence that wartime fuel shortages and rationing difficulties have affected public appreciation of oilheating. This is not easy to measure, since people have different ideas of what constitutes hardship. Oilheating users were asked if they had suffered serious discomfort because of fuel stringency. Answering "Yes" on this question were 26%. They were then asked if wartime troubles had caused them to change their opinion of oilheating, to prefer some other fuel. Four percent of oilheating users say that this has happened.

Coal and gas users were asked if their friends who burn oil had suffered serious discomfort. Humorously, this group was more disturbed about its friends than the friends were. Voting "Yes" were 36%. They also report that 11% of their oilheating friends have become so dissatisfied through hardship that they want to switch to another fuel. Several said that their oilburning neighbors periodically came to their houses to warm up.

This is not as humorous as it might seem at first glance, since present coal users are our best future prospects, as will be seen in the second article of this series, and there is nothing particularly constructive for us in having them spend three or four years sympathizing with oil users.

However, the worst impact of the war to oilheating progress lies in the relative absence of praise by oilburner users during war years. Few, if any, have been bragging to their friends about oilheating, and the cumulative effect of such praise in prewar years was a big factor in new sales.

In 1941, several hundred oilburner dealers made spot checks of their sales during the previous year to identify the source of lead that brought the prospect. The composite result showed that 56% of these leads came from direct recommendations by oilheating users, 15% came from the service department (re-

*The individuals and firms assisting were: E. P. Hacker, Ballard Oil & Equipment Co., Portland, Me., John W. Scott, Buckley & Scott, Watertown, Mass., T. A. Hodgdon, Harvey-Whipple, Inc., Springfield, Mass., C. E. Weisner, Meriden, Conn., C. P. Miller, Oil Heat Institute of Rochester, N. Y., H. M. Spade, Robison Oil Co., Hartsdale, N. Y., N. G. Howell, Babylon, N. Y., Ray Horan, General Electric Co., Bloomfield, N. J., L. A. Marshall, Warren Balderston Co., Trenton, N. J., George Clement, Modern Heat & Fuel Co., Philadelphia.

T. E. Carson, Sherwood Bros., Inc., Baltimore, H. M. Carpenter, York-Shipley, Inc., and Roosevelt Oil Co., York, Pa., George Baldwin, Fuel Oil Corp., Detroit, H. B. Allen, Oil Burning Engineers, Inc., Chicago, L. O. Woehrer, Socony-Vacuum Oil Co., and Harold Mottram, Wisconsin Oil Heat Assn., Milwaukee, J. G. Brinkerhoff, Fuel Oil Service Co., Waterloo, Iowa, W. F. Schierholz, Fuel Oil Co. of St. Louis, M. N. Vining, Diesel Oil Sales Co., Seattle, and C. A. Michaels, Century Co., Portland, Ore.

placements), 12% were responses to advertising, 10% from canvassing and 7% miscellaneous. Thus, the industry has a real job ahead to get present users enthusiastic to the point where they will again influence their friends.

The question of ample oil supply after the war, no longer of particular concern to industry men, is very much unsettled in the minds of an important percent of the public. Only 60% of those interviewed seem sure that there will be plenty. Because they are in closer touch with oil industry thinking, 75% of present oil users have no doubt about supply, but only 50% of coal and gas users think there is no question about ample oil.

This latter figure is most significant, since again coal users are our best oil-burner prospects. The chart shows the degree of certainty and varying degrees of doubt. Table IV shows by geographic sections the percent of people who feel one way or the other about long range oil supply.

TABLE IV
Opinions on Plenty of Oil Postwar
(In per cent)

	NEW ENGLAND		MID-ATLANTIC	
	Oil Users	*Non-Users*	*Oil Users*	*Non-Users*
Yes	71	42	75	59
No	1	..	1	2
Uncertain	27	34	22	23
No Opinion	1	24	2	16

	MIDDLE WEST		PACIFIC N.W.	
	Oil Users	*Non-Users*	*Oil Users*	*Non-Users*
Yes	79	43	73	59
No	1	1	..	..
Uncertain	18	35	23	24
No Opinion	2	21	4	17

Consumer opinions on fuel costs were particularly interesting, since in many cases they have a bearing on fuel preferences, the general subject to be covered in the next article. This is less true with oil, middle-of-the-road, than with gas, which many think too expensive, or with coal, which some think is all they can afford.

Price Charts Next Page

There is some indication that the cost of oilheating has been overemphasized in industry thinking. Only three per cent of oil users who formerly used coal find that it costs much more than coal. It costs no more in the opinion of 65%, and the remaining 32% say it costs some more, but is well worth it.

This is shown in the top circle of the first price chart. The next circle indicates what gas users think of the cost of gas over oil, with 12% voting that it costs much more. The sectional differences on these opinions, shown in Table V, bear less relation to the known facts than would be expected, but it is important to recognize that in selling we deal with opinions, not necessarily facts. The bottom circle on the first price chart shows what non-users of gas think of its cost.

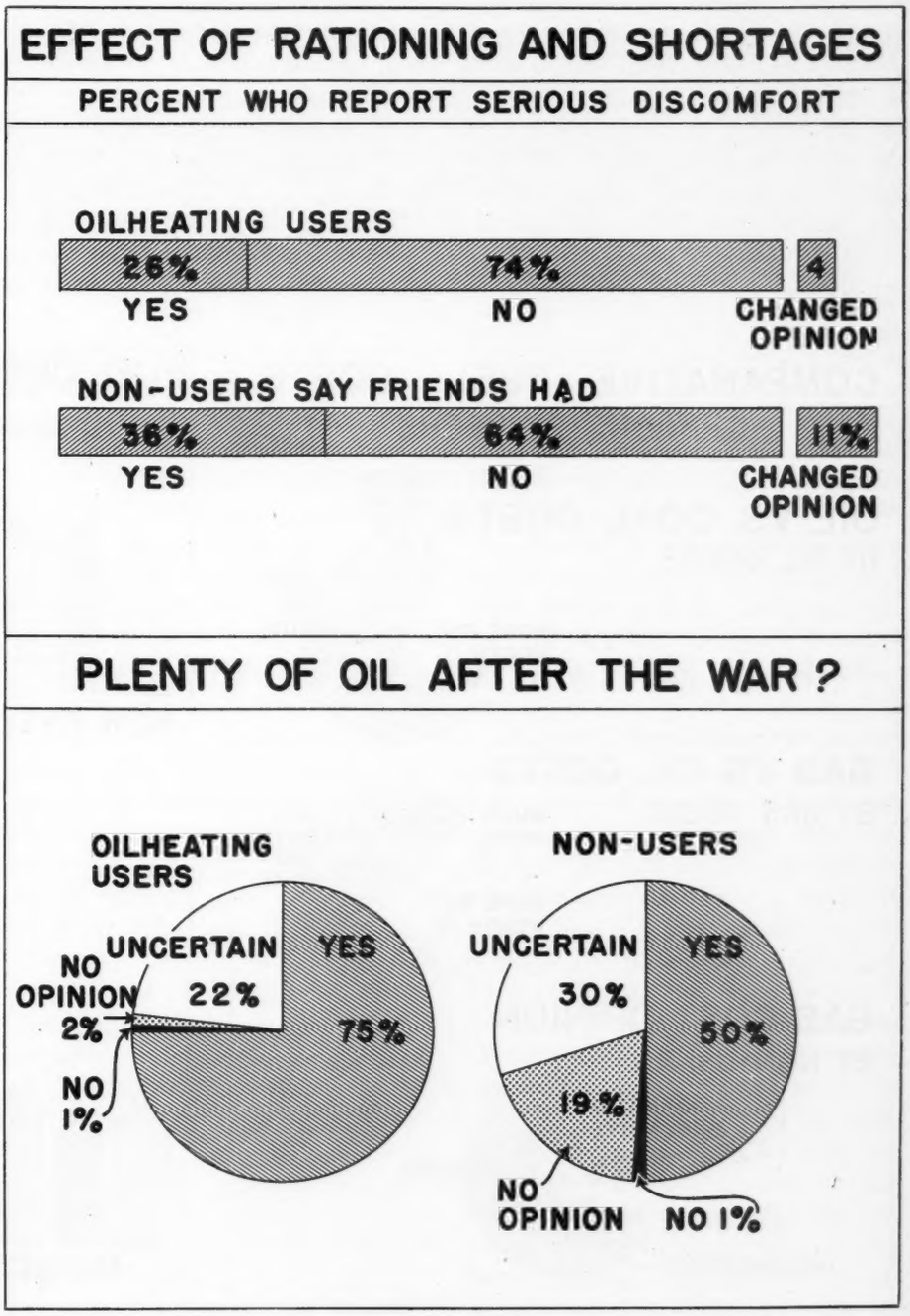
Curiously, of all of the coal users who want to switch to gas, 31% say they think it very expensive, yet they hope to use it. Some of these could be dismissed as dreamers, but by no means all of them, for 12% of present gas users think it's very expensive, yet like it, and moreover, 30% of high income families still use coal and could well afford the cost of gas.

TABLE V
Oil vs. Coal Cost Opinions by Oil Users (per cent)

	Costs Much More	*Costs No More*	*More but Worth it*
New England	2	83	15
Mid-Atlantic	5	57	38
Middle West	2	53	46
Pacific N.W.	1	78	21

Gas vs. Oil Cost Opinions by Gas Users (per cent)

	Costs Much More	*Costs No More*	*More but Worth it*
New England	11	56	33
Mid-Atlantic	11	11	78
Middle West	10	56	34
Pacific N.W.	33	..	67



The second cost opinion chart shows peoples' estimates of what fuel actually costs them. While the figures represent cost per room, naturally the opinions were not expressed that way, but rather in over-all cost per year. Dividing this into costs per room is somewhat more representative of their collective opinions than simply average cost per house.

It is important to note that these are opinions, not facts. No one was asked to go and look up fuel bills, but also we must recognize that it is opinion, rather than fact, that they express to their neighbors when mentioning fuel costs.

The coal and oil opinions are no doubt more nearly right than those on gas. When a person was asked what coal costs a year, he or she would usually answer, "Let's see, we used eight tons and it costs about fifteen dollars," or if oil was used, the typical response was, "Well, our ration is 1,700 gallons and I think it costs about ten cents." On gas there is no such simple way to remember, since monthly bills vary all over the lot, yet they did make guesses, the same guesses they would make if a friend asked them.

The gas cost estimates included, in addition to heating, all other domestic uses, such as cooking and water heating. All of the cost of other household uses should not be deducted for making comparison with oil cost, since considerably above half of oil users also have hot water cost included.

Based upon American Gas Assn. figures and those compiled by Ted Caldwell for B.O.D.A., Chicago, the proper deduction from total gas costs for uses other than heating would be about five dollars a room, to make them comparable to oil. Taking off this five dollars, the average Eastern gas user thinks he pays about $42 more a season for gas in a seven room house than oil would cost. In the Midwest, the five dollar a room deduction would bring gas heating cost down to only about seven dollars more per season in a seven room house.

It is impossible to reconcile such small differences based on known fuel cost rates, but this is what users think and say.

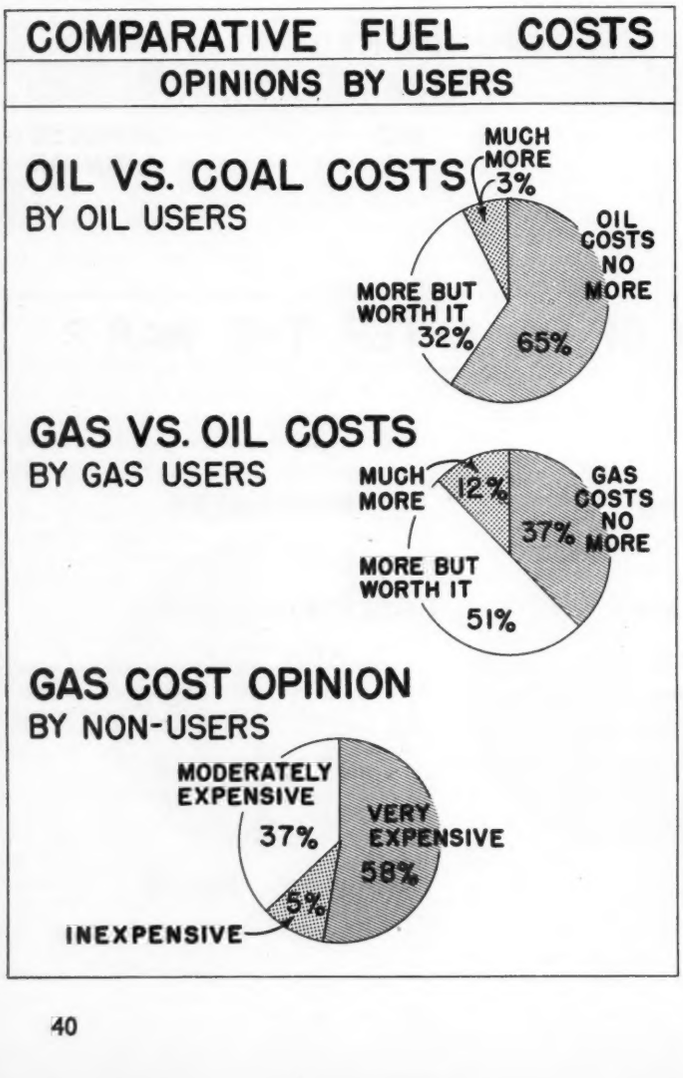
Significant is the comparison between stoker and handfired coal costs in Eastern areas. Stoker fuel costs are apparently the higher of the two. This points to a conclusion that, while stoker coal costs less per ton, more tons are used, particularly in spring and fall.

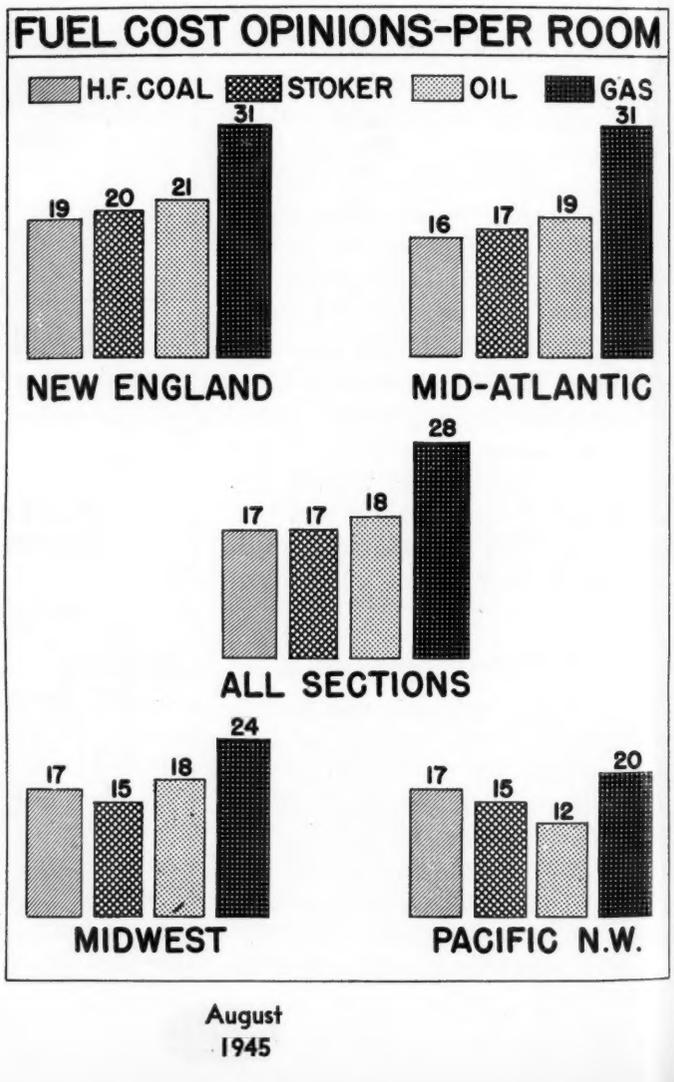
Notice the Pacific Northwest, clearly our most promising oilheating market postwar, population considered. Oil costs are actually, as well as by opinion, considerably cheaper than coal. Most coal is brought in from the east, over the mountains, with high freight costs, and what little coal is mined locally is priced the same as the long-haul imports. The low oil cost is partly due to water transport, and otherwise affected by the moderate degree-day totals.

More Insulation With Gas

It has been generally known that gas-heated homes are more thermally efficient than those using other fuels. In other words, more has been done to them to retain the heat generated, since the fuel itself is costly per Btu. It is interesting to see on the accompanying chart that there is a regular step-up from coal to oil to gas, in per cent of homes having attic insula-

(Continued on page 90)





Pick Radiation Carefully

Proper Selection and Placement Is Necessary to Good Heating

by
Warren S. Harris*

This article is based on material contained in the University of Illinois Engineering Experiment Station Bulletin No. 223, "Investigation of Various Factors Affecting the Heating of Rooms With Direct Steam Radiators," and No. 349, "Performance of a Hot-Water Heating System in the I-B-R Research Home at the University of Illinois.

In the heating industry the successful individual or company is the one providing the home owner with better heating from the standpoint of efficiency, comfort, and healthfulness at the lowest possible total cost. To obtain information which will help the boiler and radiator manufacturers to improve their products the Institute of Boiler and Radiator Manufacturers entered into an agreement in 1940 for cooperative research with the Engineering Experiment Station at the University of Illinois, and subsequently built, furnished, and completely equipped a house specifically for research work in steam and hot water heating.

This I-B-R Research Home is a two-story building, typical of the small, well built American home. The construction is brick veneer on frame, and all of the outside walls and the second story ceiling are insulated with mineral wool bats 3⅝ inches thick. A vapor barrier prevents condensation on the sheathing by retarding the passage of water vapor from the rooms into the insulation in the walls. All windows and outside doors are weather stripped. Outside doors are also provided with storm doors. The total calculated heat loss under design conditions, with temperatures of —10 deg. F. outdoors and 70 deg. F. indoors, is 43,370 B.t.u. per hour, excluding the basement.

The house has been completely equipped with thermocouples, recording thermometers, humidity indicators and recorders, and all other instruments necessary to completely evaluate the performance of a heating system.

Since the erection of this Research Home, the Institute has contributed adequate sums of money each year to provide for a continuing research program covering all phases of steam and water heating. The effect of the I-B-R Research Program is two fold: (1) It is providing the home owner with better heating from the standpoint of efficiency, comfort, and healthfulness and, (2) it is providing the dealer with selling points backed by sound scientific facts. The latter is accomplished in four ways:

A. By providing the manufacturers and dealers with reliable data on the performance of different kinds of heating units under actual operating conditions. These data thus provide a starting point from which improvements can be made.

B. By indicating the advantages and disadvantages of construction features of the house.

C. By indicating opportunities for the development of new equipment.

D. By improving the installation of heating equipment.

The importance of good heating installation practice cannot be over emphasized, for no matter how good the heating equipment supplied by the manufacturer may be, if it is improperly installed the result is a heating system which is not giving complete satisfaction.

In this article it is hoped that a few practical pointers can be presented to those charged with the job of installing steam or hot-water heating systems which will help them to make better home heating installations.

Of utmost importance are the matters of radiator selection and location. The basis of radiator selection is the heat loss calculation. The Institute of Boiler and Radiator Manufacturers have recently published a booklet known as the Installation Guide No. 1, and while this guide is specifically for the design of a one-pipe, forced-circulation, hot-water system, it contains a simplified procedure for the calculation of heat losses which may be used for any type of heating system. This simplified procedure is based upon the factors given in the ASHVE Guide. The more accurately the house measurements are taken and the more carefully the heat loss calculations are made, the more satisfactory will be the operation of the finished heating plant, for in reality the bal-

*Special Research Assistant Professor, University of Illinois, Urbana, Ill.

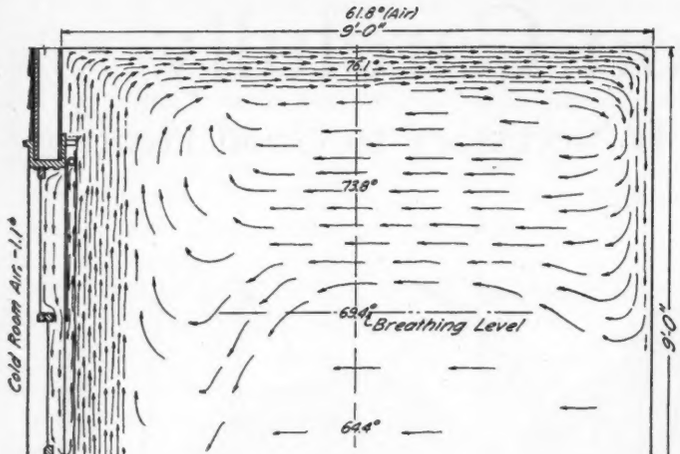


Fig. 1. *Air circulation in test room with unenclosed tubular radiator at front wall.*

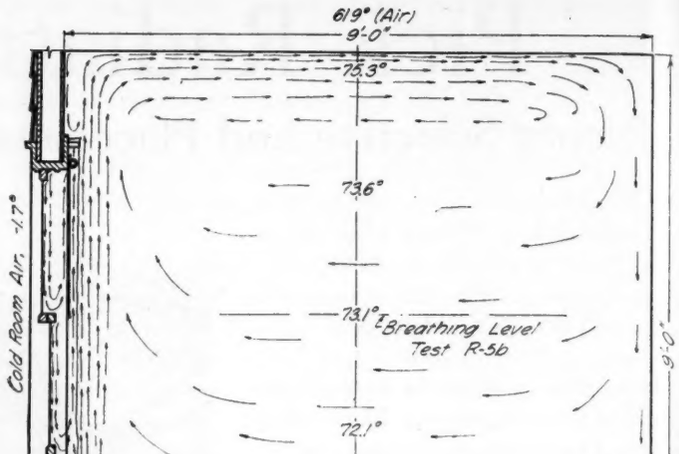


Fig. 2. *Air circulation in test room with unenclosed wall radiator at floor near front wall.*

ance of the system depends largely upon the correctness of the heat loss calculations.

For the ordinary job it is not necessary to add to the calculated heat losses any additional factor of safety or exposure factor before making the radiator selection. When the initial heating installation was made in the I-B-R Research Home the amount of radiation installed in each room was just sufficient to offset the calculated heat loss at an indoor-outdoor temperature difference of 80 deg. F., with continuous operation at the design radiator temperature of 200 deg. F. However, tests made during the first season of operation showed that, at an indoor-outdoor temperature difference of 80 deg. F., the temperature of the water leaving the boiler was not greater than 175 deg. F., or approximately 30 deg. F. lower than that selected for the design of the system, and the total operating time of the circulator was only 12 hours per day instead of 24.

These results do not prove that the actual heat loss of the Research Home was much less than the calculated value. Further tests proved that, if anything, the actual heat losses from the house were slightly greater than the calculated values. The real reason for the discrepancy between the observed values of operating

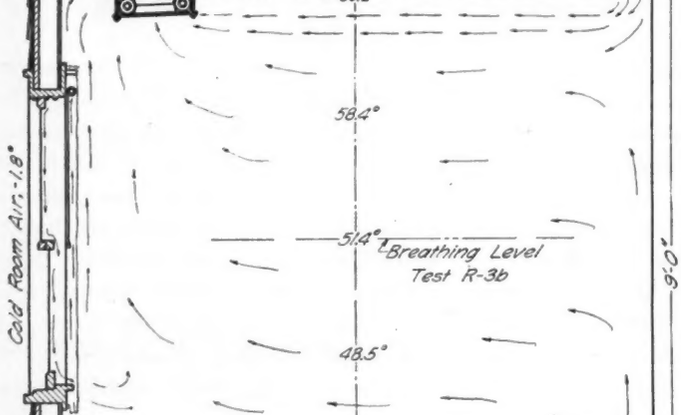


Fig. 3. *Air circulation in test room with unenclosed wall radiator at ceiling near front wall.*

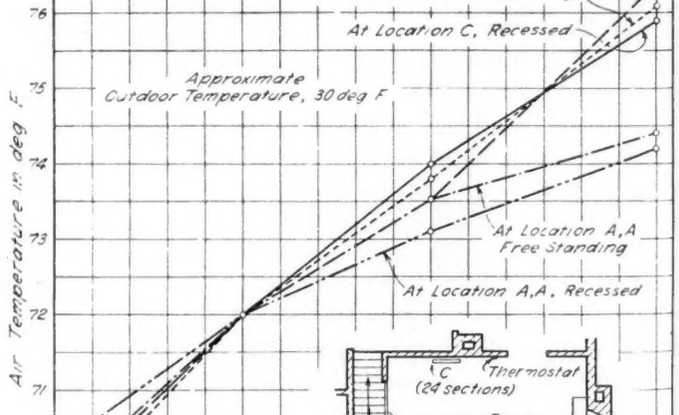


Fig. 4. *Air temperature gradient in living room at I-B-R Research Home with five different radiator installations.*

time and radiator temperature and the corresponding calculated or design values was the assumption that all of the heat required to offset the heat loss of the house would be supplied by the radiators. This was not wholly true. In fact, the radiators supplied only about half of the total heat required and the remainder was supplied from other sources such as heat losses from the boiler, piping and chimney, and heat liberated in the house as a result of the normal use of gas and electricity. While it would be unwise to make allowances for the "stray" heat sources when selecting the amount of radiation required for a home, these heat sources do provide a very liberal factor of safety in the design of heating systems, making it unnecessary to add any allowance to the original calculations for the size of the system just to be safe. To do so may not only help your competitor by needlessly adding to the first cost of your heating system, but it may even result in a system so much oversize that it cannot give satisfactory operation after it is installed.

After the proper amount of radiation for each room has been agreed upon, it is necessary to select the radiator height, number of tubes, and sections to be used. The manufacturers catalogs contain the data required to enable one to determine just how many sections of any height and style of radiator are required for a given heat loss. However, it is usually found that there are several combinations which will do the job, and which of these combinations is best suited to the particular application is left up to the person making the selection. Figure 1, 2, and 3, taken from the University of Illinois Engineering Experiment Station Bulletin No. 223, show the results of three tests made in an uninsulated test room exposed on two sides to air at a temperature of approximately zero deg. F. In each test the same amount of radiation was used. The only change was in the type of radiator or in its location. It will be observed that the wall radiator installed near the floor produced by far the most comfortable conditions in the room between the breathing level and the floor. It will also be observed that very unsatisfactory results were obtained when the radiator was placed along the ceiling, as is sometimes done in the case of basement rooms in order to keep a steam radiator above the water line of the boiler. These results show the desirability of using long, low radiators placed near the floor.

Recently five series of tests were made in the I-B-R Research Home to determine whether the location and arrangement of the radiators had any effect on the comfort conditions maintained within the heated room. Nineteen-in., 4-tube, small tube type radiation was used in every case. Figure 4 shows the location and arrangement of the radiators used in each of the given series of tests and the air temperature gradient obtained in the living room in each series. These curves indicate that with a given radiator location, similar temperature gradients were obtained within the room with both free-standing and recessed arrangements. All five of the installations produced approximately the same temperature gradient in the living zone, or that portion of the room below the 60-in. level. However, the recessed radiators under the windows produced a somewhat smaller temperature gradient and warmer floor than did the other installations.

The lowest ceiling temperature, 74¼ deg. F., also resulted from the use of recessed radiators placed under the windows in position A. Slightly more than 76 deg. F. was obtained when they were

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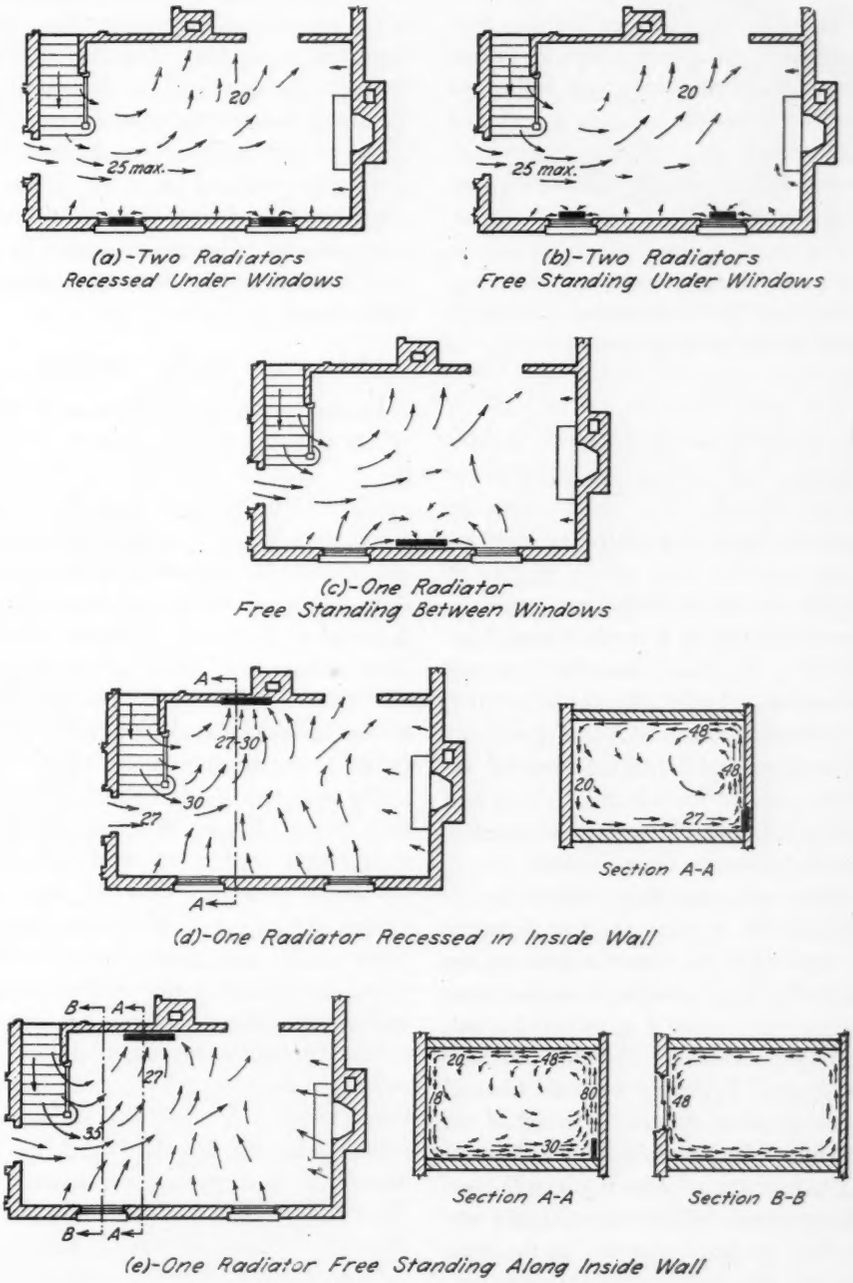


Fig. 5. *Air movements in living room of I-B-R Research Residence with five different radiator installations.*

For Vaporizing Burners

All Industry Elements Have Responsibility for Their Success

by
Frank J. Coonan*

(Edit. Note—The author has had wide experience in the operation and servicing of vaporizing furnace units in the Philadelphia area, where many thousands have been installed in small home builder developments. This is the first of three articles on the subject, and points out principally the author's opinion that this type of equipment is not only satisfactory when properly handled, but is our industry's best present bet for smallest homes and water heating. He criticizes the attitude of many dealers, service men and oil companies toward this equipment, in the belief that any dissatisfied oilheating user injures over-all acceptance of oilheating. The two articles to follow deal specifically with servicing this equipment.)

A NUMBER OF YEARS AGO a notable charitable organization successfully appeal to the public for funds, chiefly by means of a pamphlet describing their activities. On the cover was a picture of two pitifully crippled children, with the by-word, "Suppose Nobody Cared." Inside was a resume of how much money was needed and how it was to be utilized, by establishing neighborhood clinics for preventative work, making hospital facilities available for advanced cases, and carrying on research work in an attempt to totally eliminate these diseases.

Perhaps what would be appropriate for a great many of us in the fueloil industry, to awaken us from the lethargy we have fallen into, would be a similar pamphlet on which would be pictured a sick vaporizing oilburner. The by-word here should say, "Evidently Nobody Cares." The descriptive material, instead of an appeal for money, would analyze the need for good service on these burners, the underlying causes behind the atrocious service that has been rendered in the past, place the responsibility for this poor service where it rightfully belongs, and point out what we must do in the future to eliminate it.

This article is written in the hope that through the joint cooperation of the parties involved, the necessary educational program, so sorely needed right now, will be forthcoming.

Anyone connected with the fueloil industry must admit that the operation of many vaporizing burners has been anything but satisfactory. The responsibility for such operation can fall separately on the dealer and service men who either installed or serviced them, on the manufacturer who produced them, or on the oil companies who delivered the oil to them, but it usually falls jointly on all four involved, as can be seen from an individual break-down.

Unsound Dealer Attitude

Dealers when approached as to what efforts they are making toward remedying the situation will tell you that they are willing to let these units die a slow death, that as soon as equipment becomes available, their intention is to replace them with mechanical equipment. But it's doubtful if they will. Consider furnace replacements first. What do we have to offer those low heat loss homes? We have mechanically fired furnaces with a bonnet rating approximately twice what is actually required to offset the heat loss of most of these homes. If we were to make replacements with mechanical equipment we would probably wind up with customers still dissatisfied. These oversize units would give poor comfort levels, with thermostat over-ride on the on cycles and air stratification caused by long off cycles. The efficiencies would be low because of short on periods and standby losses. Dealers are going to find that most people who are disgusted with an oilburner are also disgusted with oil heat. They will also find that just as the gas refrigeration companies have concentrated on the unhappy owners of cantankerous electric refrigerators, so, too, will the gas heat industry concentrate on the disgusted owners of vaporizing oilburners. Their salesmen will have all of this information at their fingertips and, in addition, they will be armed with equipment that has no practical minimum firing rate, such as our mechanical equipment.

Where water heaters are concerned we have nothing to offer the owners of small warm air heating systems other than vaporizing equipment. It is inconceivable that we can sell those small home owners mechanical fired water heaters, retailing at two to three times as much as the price of either a gas or electric water heater, and with capacities many times that required by the average home owner.

In these two categories, warm air heating of the small home, and water heating in practically all homes heated by warm air, vaporizing equipment fits. We must learn to install and service this equipment properly or hand a great percentage of this business over to our gas competitors, who will certainly have a field day postwar, not only in replacement of our vaporizing equipment, but also in the tremendous new home building program, the greater percentage of which will again be small, low cost, low heat loss homes (less than 1 GPH firing rate), built primarily by the same operative builders, who built them in the past, a great number of whom have become soured towards oil heat because of the complaints of the purchasers of homes in their previous operations in which vaporizing burners were installed.

Service Men's Attitude

Service men don't understand, and unfortunately, too many of them don't want to understand, vaporizing burner service. The attitude of service men toward vaporizing burners and their reluctance to spend the time and effort necessary to become proficient at the servicing of this equipment, is illustrated in the following incident which happened to me about two years ago.

A vaporizing manufacturer had donated a furnace to the vocational school of Philadelphia, which was con-

(Continued on page 94)

*Modern Heat & Fuel Co., Philadelphia.

Plenty of Hot Water

Hot Water on Tap Goes with Modern Oil Heating

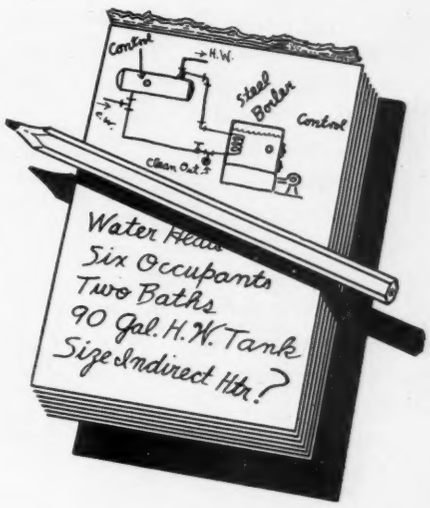
by
J. W. Schulz

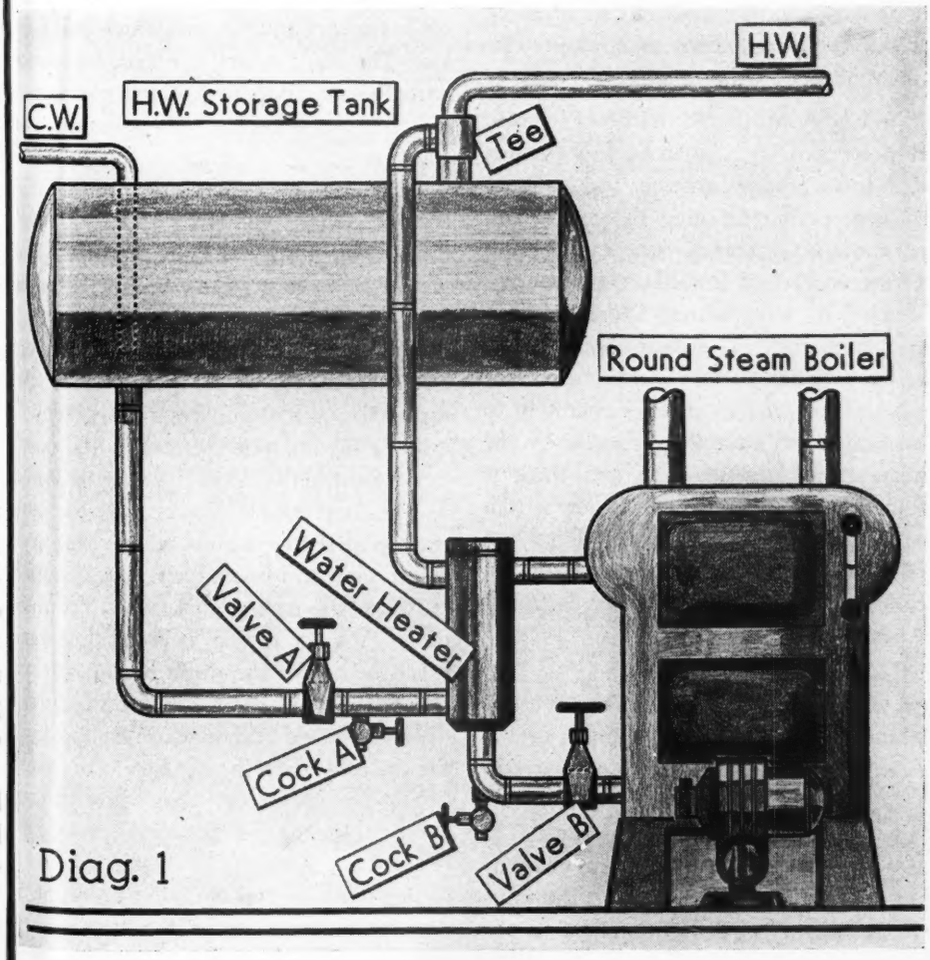
A GOODLY supply of steaming hot water on tap at all times is the proper companion to modern heating for a four-room bungalow or a 15-room mansion. That's why water heating is important to the men in the oil heating and fueloil industries.

Indirect water heaters of the tank and tankless types are the acknowledged favorite equipment for providing summer-winter hot water in homes equipped with boiler-radiator heating plants. One burner does all the work, heating the house and the water. The extra fueloil it uses because it heats water throughout the year is next to nothing because in truth the efficiency of many heating plants is increased by using them year-round instead of only during the heating season. Year-round operation reduces expenses of servicing oilburners because it eliminates the summer idle period which frequently ends with the burner equipment crippled by dampness. Heating boilers also are benefited by year round operation, for summer idleness often causes greater deterioration than comes during a season of heating. All told, there are many weighty advantages to using an oilfired boiler-radiator plant for year-round water heating.

Standardization of layouts seemingly is needed in connection with indirect water heaters. Advanced practices being followed in some parts of the country are unknown in other parts. This applies particularly to tank-type indirect water heaters, which will be discussed here in detail.

Sizing up a boiler with an eye to converting it to summer-winter water heating service brings up the same questions that arise when an installed indirect water heater proves troublesome or inadequate. Which size hot water storage tank is needed? How large an indirect water heater is required? What about pipe sizes and piping layout? How many valves are needed in the layout and where should they be installed?





Diag. 1

Diag. 1, which includes a cast-iron round steam heating boiler, shows piping details between the indirect water heater and the hot water storage tank which are suitable for heating plants of the hot water type as well as the steam type.

The size of the hot water storage tank shown in this diagram may be ascertained by using this thumb rule, time-tested on hundreds of installations. Provide 10-gallons of hot water storage tank capacity for each regular occupant of the house if you judge that the occupants are the type that use moderate amounts of hot water. Now you have to get personal and judge whether or not the occupants are the bath-a-day or shower-a-day type, for if they are you must provide 15 gallons (instead of ten) of hot water storage tank capacity for each occupant. As you count up occupants, count each infant in the house and each servant as two occupants. Regardless of the number of occupants, install a tank of 40-gallon minimum size for a home with one bath, a

tank of 60-gallon minimum size for a home with two baths, and 20 gallons additional tank capacity for each additional bath.

The application of this rule works out this way.

Example #1. In a one-bath home there are four adults. For people judged to be light users of hot water, the tank size would be 40 gallons; for heavy users of hot water it would be 60 gallons.

Example #2. In a one-bath home there are three adults, one infant, and one servant. Counting the infant and the servant as two occupants each, the number of occupants is taken as seven. The minimum hot water storage tank size would be 70 gallons. For heavy users of hot water, a 105-gallon tank would be installed.

Example #3. In a two-bath home there are six adults and one servant. Number of occupants is taken as eight, and calls for a tank of 80 gallons minimum size, or 120 gallons for people judged to use a great deal of hot water. Minimum tank size for any two-bath home, 60 gallons, is not significant because it is less than the 80 gallons figured as minimum for the number of occupants.

Example #4. Four adults occupy a home which has three baths. For the occupants, a 40-gallon or 60-gallon tank would be needed, depending on whether they use hot water freely. But for three baths a minimum tank size of 80 gallons is needed, therefore in this case the fact that there are three baths is the deciding factor.

Anticipate the Future

Judgment is all-important in selecting the tank size. You may, for example, decide to deal in terms of six regular occupants instead of four where really there are four occupants but the house is suitable for, and likely to harbor, additional occupants or weekend guests. The owners' ambition to own a post-war electric dish washer or washing machine for clothes may cause you to add 50% to the tank size you had in mind. If all the occupants take showers at the same time each morning or if heavy dish washing at night is likely to be followed by several baths or showers, a larger hot water storage tank will be needed. Such exceptional circumstances and activities must be taken into account. In spite of this, however, the thumb rule as given will serve satisfactorily for at least 19 out of 20 homes. It is aimed to provide ample hot water, even for occasional exceptional doings, but it does not result in the installation of a 100-gallon tank where use of a 50-gallon tank would give enough hot water on all but one or two days out of the year.

The hot water storage tank should be installed horizontally in every instance. This applies even to 40-gallon tanks, which in some parts of the country up to now have seldom if ever been installed horizontally. With proper piping and indirect water heaters of adequate capacity, 40-gallon tanks work well in the horizontal position—far better than in the vertical position. They heat rapidly and fully, with the result that the heaters connected to them can provide much more hot water for peak loads than they could otherwise. Anyone who has doubts about this would do well to go through the educational experience of switching just one 40-gallon tank from the vertical to the horizontal position, making certain to arrange the piping properly. The results will speak for themselves, and from then on this position for 40-gallon tanks undoubtedly will be considered standard by the experimenter rather than, as one old-timer put it, "revolutionary."

Valves A and B and draincocks A and B shown in Diag. 1 must be installed, for each has a definite function. Valve A and cock A permit cleaning the heater coil periodically, as must be done several times a year on certain installations which are affected by hard water. Close valve A and open cock A wide to use full city water pressure to clean out the coil thoroughly. It's wise to arrange definitely to have such coil-flushing performed by the home owner or your service man three or four times a year unless you know (from seeing little sediment flushed from the coils when they are cleaned that frequently) that in your locality fewer cleanings will do.

Gate valve B is for throttling the flow of water through the shell of the water heater during the coldest months of the heating season, should this be necessary to prevent overheating of the hot water storage tank. The way to use this valve is to close it fully, then open it about one-quarter of a turn, for usually closing the valve about halfway or so has no effect on the tank temperature. If the boiler water is dirty, gate valve B may be closed and cock B opened to clean the shell of the indirect heater. For maximum effect, clean the shell during the heating season and with steam pressure on the boiler. If the boiler water is kept clean as it should be, through draining rusty water from the boiler when necessary and applying suitable boiler water treatment compound to a boiler which needs it, it should seldom be necessary to use cock B.

Keep Lines Short

For maximum output from the indirect water heater, connect it to the boiler with pipe lines which are short as practical for the particular installation, and have the pipe size the same as the shell openings provided by the manufacturer of the indirect heater. The lines between the indirect water heater and the tank should be the full size of the coil openings of the heater if steel pipe is used. If brass pipe or solder-type copper tube fittings and rigid copper tubing are used, with most indirect water heaters the lines to the tank may be one pipe size smaller than the coil openings in the heater. This holds true especially if the heater is sized in accordance with instructions which will follow. The point is well checked, however, with the manufacturer of the particular indirect water heaters you generally install.

Diag. 2 shows an important piping detail—important enough to make a wise installation foreman take a tank to a welder to have a large coupling welded into the top because the tank opening originally in the tank is undersize. The line from the top of the heater coil to the top of the tank terminates in a tee, which must be mounted on the tank in the position shown in the detail drawing of Diag. 2. The short nipple between the tee and the top of the tank must be one pipe size larger than the line which comes to the tee from the indirect heater. In the diagram, A is the nipple, B is the flow line from the coil of the water heater, and C is the supply line to the hot water fixtures.

Diags. 1 and 2 show the best location for the cold water supply line to the tank (C.W. in Diag. 1). This comes down through the top of the tank to within about two inches of the tank bottom. When hot water is being drawn at a high rate, cold water enters the tank at an

"DL" Float Valves Help Protect Rolling Field Kitchens

In the last war, someone was always shooting the cook—just about dinner time. The smoke from coal or wood-fired rolling kitchens made a fine target for enemy artillery and bombers.

Our army field kitchens are now fired by gasoline or oil. There is no telltale smoke to reveal the location of the kitchen and the mealtime concentrations of men. Meals can be cooked after nightfall because the kitchens do not glow.

Thousands of these field ranges, tent heaters, water heaters and furnaces—wherever our men are fighting—are equipped with "DL" Float Valves.

"DL" Float Valves are in demand by manufacturers of war equipment because of their simplicity of design. A screw driver is the only service tool needed.

When our soldiers return, thousands of them will remember the reliable service rendered by "DL" Float Valves, making much more saleable the postwar stoves, furnaces and heaters equipped with these valves.

An Important "DL" FLOAT VALVE FEATURE

AUTOMATIC TEMPERATURE COMPENSATION

Fuel oil viscosity increases as temperature drops. To avoid underfeeding when oil is cold—overfeeding when warm, the "DL" Float Valve has a simple temperature compensation which automatically maintains constant fuel delivery regardless of temperature.

DETROIT LUBRICATOR COMPANY

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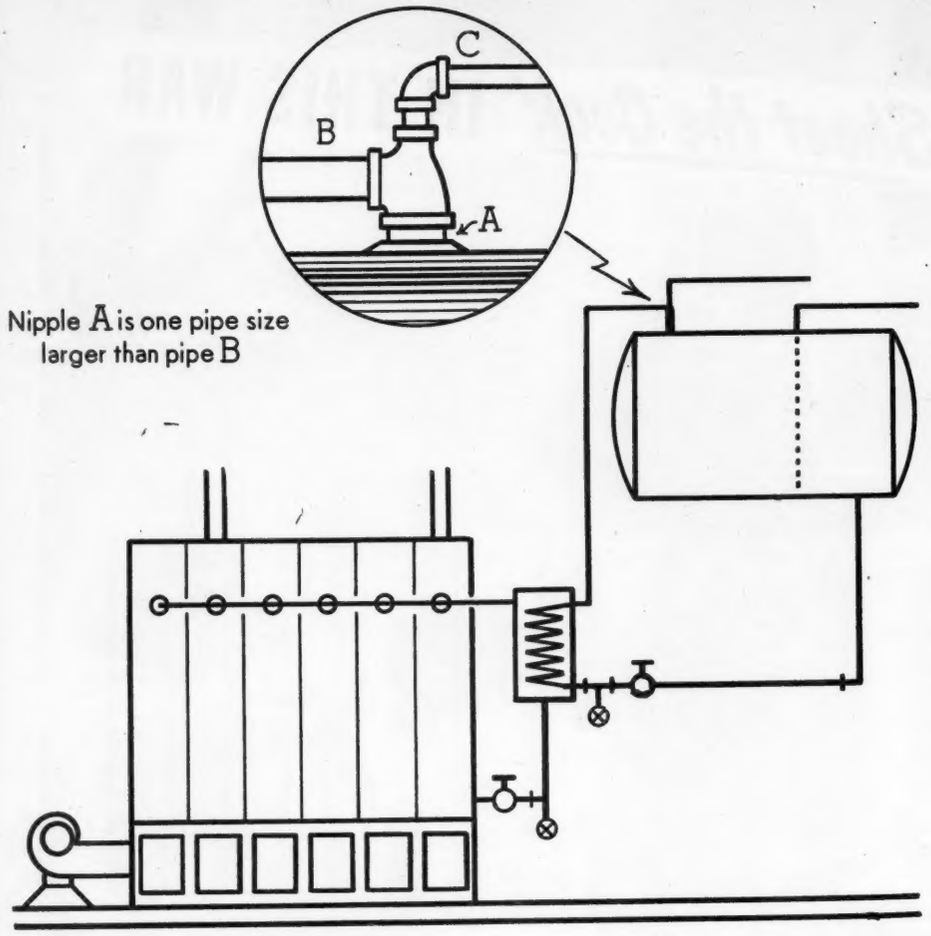
"DL" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators



Diag. 2

equal rate of course, and this arrangement tends to spread the cold water in a way that leaves the last few gallons of hot water unmixed with the entering cold water. When a 60-gallon tank contains 20-gallons of hot water, the faucets will continue to give hot water only if the 20-gallons of hot water in the tank are not mixing with the entering cold water.

The importance of locating the storage tank high with respect to the indirect heater can not be overemphasized. In basements which have low headroom, try to fit the top of the tank up between the beams to gain a few more inches of tank height than you would have if the tank were installed at right angles to the beams. Also, consider raising the tank a few inches after you have connected the pipes to the top of it. If you don't do this, the tank may be lower than need be, only because room was needed to swing wrenches over it for making the top connections.

Diag. 2 shows a cast-iron sectional steam boiler properly fitted with a manifold which connects every boiler section to the shell of the water heater. Provide such a manifold for every boiler which needs one, and for best results don't skip hooking the manifold to the front, rear, or any other section. There are, of course, cast-iron steam boilers of the vertical sectional type which are designed for oil-firing and which have large upper nipples, half filled with water, which eliminate the need for manifolds.

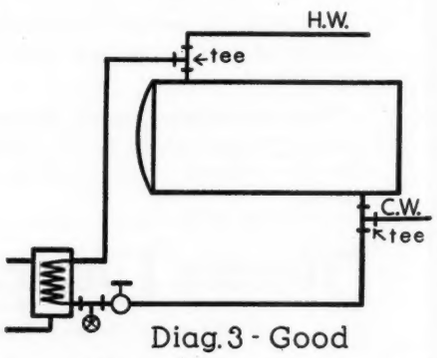
To ascertain which size indirect water heater is needed, check the heater manufacturer's tables which give capacities at 180° boiler water temperature. Aim to install a heater which will raise the tank temperature 100° in from one and one-half to two hours. You may have to do some figuring because standard heater ratings generally are given on a three-hour basis.

Suppose, for example, you want to install a heater which will raise the temperature of a 60-gallon tank 100° in two hours. You are aiming for 30-gallons per hour (60 in two hours), therefore you can use a heater rated at 90-gallons, 100° rise, in three hours, with boiler water temperature 180°. To heat the same tank in one and one-half hours would call for 40-gallons per hour, or a heater rated at 120-gallons, 100° rise, in three hours, boiler water temperature 180°.

When would you want to heat the tank in two hours, and when would you want to heat it in one hour and one-half? The answer lies in selecting a heater of minimum size on the two hour basis. Pick that size or the next larger size from the manufacturer's tables. As with selecting boiler sizes, you may not find precisely the size heater you want, when you search in the manufacturer's listings. Regardless of this, do not select a heater so small it can not heat the tank fully in two hours.

Next, if you want to play safe in selecting the heater size, perhaps because the tank is about 20% smaller than you would prefer to have it for the load, select the heater on the basis of heating the tank fully in one hour and one-half. This basis should provide about as large a heater, for the tank size, as you ever would want to use, as there is a definite limit to the amount that an oversize heater can help out an undersize hot water tank. It is not wise where you have a tank half as big as the load calls for, for example, to try to make up for it by selecting the indirect heater on a one hour basis.

An optional and fairly good method for connecting the cold water line to the tank is shown in Diag. 3. Use this layout where the tank hasn't as many openings as is needed for the regular layout, or where you are having larger welded connections provided at proper locations and want to minimize the welding. Locate the cold water tee close to the tank. If the size opening at the bottom of the tank is large enough for this, use a nipple between the tank and the tee which is one pipe size



Diag. 3 - Good

larger than the flow line to the coil of the indirect heater (as you do at the connection at the top of the tank). The layout in Diag. 3 seems to give no penalties for tank sizes above about 60 gallons. For smaller sizes, it may give mixing of cold

(*Continued on page 92*)

Climatrol

REG. U. S. PAT. OFF.

BY MUELLER

Makes you a

"Comfort Merchant"

and that's the keynote of your post-war success . . .

Comfort depends primarily on conditioning of air—and that is what you are selling when you feature Mueller Climatrol winter air conditioners.

Conditioning of air may be accomplished in these six ways:

1. Temperature control.
2. Humidity control.
3. Proper movement of air.
4. Introduction of fresh air.
5. Removal of dust, pollen, and other foreign matter.
6. Removal of bacteria conveyed on dust.

The Mueller Climatrol system is *basically designed to handle and condition air.* That means that you *start your customer in the right direction.* Later he may add accessories to deliver more of the six comfort factors, as these accessories are perfected and become available.

Mueller offers you the most complete warm-air line on the market. Mueller's 88-year performance record is your assurance of satisfied customers and a reputation for successful installations. Nationally-known, nationally-advertised. Write for bulletins. *L. J. Mueller Furnace Co., 2004 West Oklahoma Ave., Milwaukee 7, Wis.*

Member

WARM AIR · MOIST AIR · HEAT · CLEAN AIR

There are Mueller units for old or new homes of every size, type, and price range.

F-16

Specially designed for efficiency and economy with oil.

fuel oil & oil heat

Tight Fueloil Supply Next Season Apparent

IN NEWSPAPER AND RADIO scripts during recent days, both PAW and OPA officials have been trying to convince the public that heating oil supply for next season looks particularly tight, pointing out the obvious increase in military needs due to the long distances involved in the Pacific war. Definite checks of consumer and dealer opinions have demonstrated to Washington the serious need for this verbal barrage. It is necessary to convince not only the public and the industry, but also the local ration boards.

After three seasons of pessimistic education on stringencies and acute shortages of this commodity or that, local board members and clerks are beginning to yawn. This is a natural reaction. The generally good job done by boards has prevented many dire predictions of calamity from becoming realities—everyone got by somehow, and at this stage of the war additional alarms fall rather flat. Board members and clerks are people; they are rationing their neighbors, and eventually everyone gets tired of being a professional sourpuss.

Clear evidence of how boards are relaxing is the excessive over-issuance on gasoline. When it became apparent that the European war was about over, or some six weeks before V-E Day, gasoline issuance jumped almost overnight to far above quota allocations. It reached about 90,000 barrels a day excess, although there had been no regulations or instructions to boards to liberalize—quite the reverse. Just about the time that there appeared some hope of reducing this excessive issuance, PAW announced that coupon values would go up 50%, come V-E Day. So the local board ladies sighed with relief, bought new hats and smiled at the neighbors, at long last.

PAW was to some degree unrealistic in giving OPA the additional 140,000 barrels a day of gasoline and publicly announcing that coupons could go up 50%, for this ignored the current overdraft with the attitude that it's OPA's problem. As a result there is probability of a gasoline drought before the third quarter is past. The best men in PAW did not see it that way, but they were over-ruled by the less cooperative elements.

Every effort must be made to prevent a repetition of gasoline's experience in fueloil. That has much to do with the present public education campaign. It takes the curse off local board members by convincing the neighbors. PAW's Distribution and Marketing Division and Public Relations group are splendidly assisting OPA in this important assignment, the type of inter-agency cooperation that the public deserves.

The educational campaign must succeed. Fueloil supplies cannot stand liberality in over-issuance by boards nor excessive hardship appeals by users. The supply and demand position for the coming season is nip and tuck. It will be impossible to do all of these three things: meet the full Army-Navy estimates on their needs for all products; continue the present high consumption of civilian gasoline; have enough heating oil for par value coupons throughout next season. As of today, it looks like we will get a cutback in the aviation gasoline program, possibly as much as 100,000 barrels a day. If this happens, the saving will be passed down through the barrel and relieve all products, but relieve them only to the degree of meeting minimum rationed needs. Aviation gas is piling up in storage at the gulf, with a number of idle tankers waiting for other products. If aviation gas cannot be cut back by that amount, civilian gasoline coupon values will probably be cut for the fourth quarter.

Evidence of the success of the newspaper and radio campaign is reported by one large Brooklyn fueloil distributor, who finds his customers hesitant to deposit their coupons, with the explanation that if oil is to be that tight, it is better to keep the coupons, to be able to shift suppliers if necessary. The oilheating industry may also be hurt slightly by having some customers frightened over to gas installations, but in the long run the industry will be helped more if the campaign prevents excessive generositty by boards, which could result in a complete supply collapse at the midwinter peak.

Keep Your Public Informed

by

A. G. Winkler

OCCASIONALLY one of your local newspapers—daily or weekly—is going to print something in a news or editorial column which is against the best interests of your business. These are days of rumors, and counter-rumors, filled with distorted facts, and with truths and half-truths. Columnists, and editorial writers are having a field day. Whenever censors clamp down, or whenever the Government enters into a situation and wants to promote a certain reaction in the Nation, it provides the writers with some little justification for guesses. They write what they hear, or what they guess to be right. Generally they are sincere. But often they are mistaken, and this is particularly true when they touch on technical matters—such as future fueloil supply, methods of house-heating, air conditioning, etc.

The subject which is most important to this industry is the oil supply. Others, such as types of heating systems the public wants, and what the public will spend money for after the war, are subjects in which we have a vital interest. But the fueloil supply is the most vital now, because there is even disagreement about it in the Government, and also because competing coal and gas forces are much interested in convincing the public that fueloil supplies are about exhausted. Stories are planted, and gullible columnists, reporters and editorial writers pass the planted stuff on, and ultimately it reacts against your industry's welfare. And of course, anything, even in a national publication, which affects your industry, affects your local prestige and the value of your business. When such an item appears, it is always wise to try to get an opposing statement into your paper as soon as possible. If you know the Editor, call him up and explain that you are sending a letter. If he will take quotes over the phone, then give him a statement. If you don't know the man, write him a letter anyhow. Never abuse him by questioning his motives, and don't call him a dope. Assume he made a sincere mistake,

VOICE OF THE PEOPLE

Please give name and address with your letter We will withhold both on request

U. S. OIL RESERVES

Manhattan: I am a little concerned about your editorial "Oil—Lifeblood of Empire" in your issue of June 30. If the public should embrace the idea that our oil resources are almost ended, and thus reduce their purchases of oil heating equipment when the war opens up our market, it would be a grave mishap for that industry of 250,000 hardworking men and women. It would also affect the welfare of the millions of stockholders in oil companies, and the manufacturers of equipment for oil heating purposes. But most of all, it would be a severe hardship on millions of citizens to deny them the benefits of clean, economical oil heat, through their fear of the future.

Probably the best informed oil geologist in the world is Wallace E. Pratt. He has stated that "the earth should ultimately give up 700 billion barrels of oil." To date, we have produced from the globe about 40 billion barrels, in 100 years of oil consumption. The U. S. A. alone has produced 25 billion barrels in that time, and we now have proved resources of 20 billion barrels. But, whenever the pinch is on, and prices give our producers a bit more incentive, they do more wildcatting and produce a great deal more oil than we can use.

At the last meeting of the Oil Heat Institute of America, before the ODT clamped on the no-convention rule, there was a round table of discussion among many men who have studied this problem on a lifelong basis. They came to the conclusion that the world's oil supply will begin to dry up about 2876 A. D., but the year to worry about, really, is 3800 A. D., when we should be getting toward the end of our present visible supply.

After that, coal deposits alone could supply the world with oil for 1,000 years, and oil from shale for 60 years more. A. G. WINKLER.

FEARS A SELLOUT

Manhattan: Doesn't anyone a damn that our nation sold into foreign bonds to the entire having a

ADULT DELINQUENCY

Manhattan: About the young people being so bad these

and you are anxious to help him, and through him, the public.

On June 30, the New York *Daily News,* with 2,000,000 daily circulation, ran an editorial entitled "Oil—Lifeblood of Empire" summing up our war casualties, and in an interesting fashion pointing out that "many of these casualties were incurred on account of oil, when you trace them back to first causes." Reasoning: The Japs wanted Borneo oil, hence their grab at it. Hitler wanted middle Eastern oil, hence his grab at North Africa. Sample sub heads: "Oil and Casualties"; "Will our Oil Ever Run Out"; "Oil and the Pacific War." Sample quotes: "We have been extremely lavish with our oil, in both war and peace, and it seems a certainty that some day we shall run dry of petroleum in its crude form" . . . . . "What if we do run out of oil some day? Well, the U. S. has the biggest coal deposits of any nation. . . . Oil and gasoline can be made from this coal. . . . it is expensive up to now, but doubtless we can cut the costs."

The editorial did not state that we are short of oil, or would run out soon. It simply raised the question, and left it hanging in mid air. As we all know, any raising of the question, at all, was bound to have negative results for this field.

A letter was written to the Editor and published on Thursday, July 12 (see cut). (Publication was delayed by the local newspaper strike). It just happens that in this case there is a mild personal contact between the letter writer and some of the newspaper personnel. A check-up indicated that, despite the thousands of fueloil and oilheating dealers, salesmen, servicemen and others among the two million readers of the paper, this was the only letter they had received to clear up the situation created by the article.

A 3c stamp, plus a few minutes of writing, or dictating to a stenographer, or phoning a newspaper, can work wonders in keeping your business protected from uncertain, negative or vicious statements in your local newspapers. The publishers want your business to progress rather than suffer, and will co-operate if you'll take the first step.

Air Out of Place Shown Cause of Service Trouble

EFFECTS OF AIR in oil lines were demonstrated visibly and the cause explained to 500 visitors who attended the one-day Open House and Trouble Shooting course which Sid Harvey, Inc., offered during June at the company's Valley Stream, N. Y., plant. Demonstrations employed transparent plastic tubing on suction and nozzle lines of the fuel unit mounted on a regular test stand. Action of the oil and air under vacuum and pressure could easily be seen.

The first demonstration showed how air could get into a two-pipe (suction and return) job. First it was shown that no air would get into the lines under what would be normal field conditions,—that is with all the connections tight and no visible oil leak when the pump was operating on a suction of up to 10". Then the line was restricted with a packless valve until the vacuum reading showed 20" to 25" of vacuum. This is a condition which would be simulated in the field by having a partially stuck (a) foot valve, (b) anti-syphon valve, (c) anti-hum valve or even clogged strainers.

This seemingly tight line under normal conditions leaked air bubbles into the oil under abnormally high vacuum. This air did not affect the operation of the pump as the pressure gauge stood steady and would remain so until the amount of oil drawn in was not sufficient to feed the nozzle. All of the air was eliminated through the return pipe.

The condition that developed however, was that with some fuel units the pump that was running as "quiet as a kitten" before, developed a rattling noise. This was caused by the air going through the pump. This was easily demonstrated by reducing the vacuum to normal and the noises disappeared.

It was also demonstrated that even if the pump did run out of oil entirely that where a two-pipe line was used the pump never got air-bound and all that was necessary to do was to supply more oil and the pump would again function normally. The point brought out was that noise was caused by an air leak which, if not corrected, would again appear on a replacement unit.

To test for this condition all that is necessary to do is to run a temporary suction line into a can of fuel oil on the cellar floor and listen. If the noise disappears then it is a matter of clearing the obstruction which caused a high vacuum and the pump again will be okeh.

The next demonstration was to change this same unit from a two-pipe line to a single pipe line under the same conditions. Every good installer knows that a two-pipe line should be used whenever the oil is drawn in by suction from an outside tank. However, there are many jobs operating with only a single pipe line under these conditions. To show what happens when there is an air leak, the same procedure was followed. The line was perfectly tight up to 10" to 15" of vacuum but when it went over that the air bubbles again appeared in the suction line, but this time they were not eliminated, but built up in the pump until the pressure went down, caught up again temporarily and finally dropped to zero. This might mean a puff in the field. While the pump was getting air bound, air was seen to enter the nozzle line. After the oil supply stopped, a burner in the field would normally shut off under safety. To start it again all that would be necessary would be to vent out the air, but if the obstruction that was causing the high vacuum is

(*Continued on page* 91)

DISTRIBUTORS . .

THE FAMOUS YORK-HEAT PACKAGE PLAN

"D-DAY" has dawned for York-Heat distributors! Never before have distributors of automatic heating equipment tackled such a hungry, receptive market . . . with such an imposing array of sales-closing tools as the comprehensive York-Heat Package Plan.

Production of York-Heat . . . America's most complete line of domestic, commercial, and industrial post-war oil-fired equipment . . . is mounting day by day. Broad national advertising, coupled with a flexible, local, cooperative advertising plan, paves the way with a public already favorably disposed toward York-Heat. A streamlined, non-recourse, profit-sharing Financing Plan makes consumer purchase of York-Heat easy. York-Heat's Domestic Bonded Installations are without parallel in the field.

This is the famous York-Heat Package Plan you've been hearing about. It is complete in every detail, for the effective selling of the "package" the purchaser of automatic heating equipment demands these days . . . *complete automatic heating satisfaction.*

You may still file your application for a York-Heat franchise. If you want to be in there swinging, while competition is still getting under way . . . and assure your post-war future . . . mail the coupon below without delay!

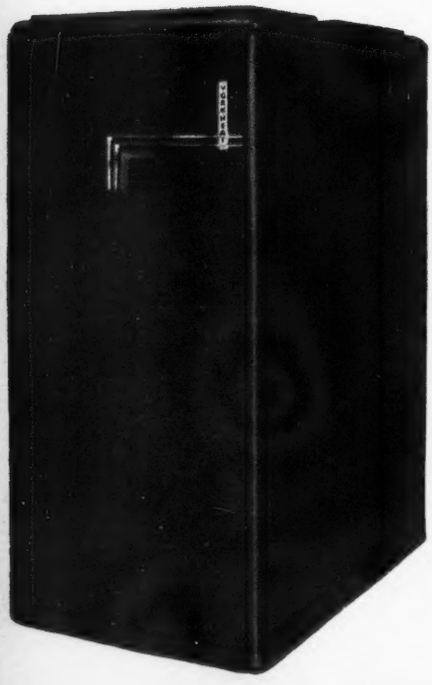
Installation Bond . . . satisfactory domestic installation guaranteed by one of America's leading insurance companies.

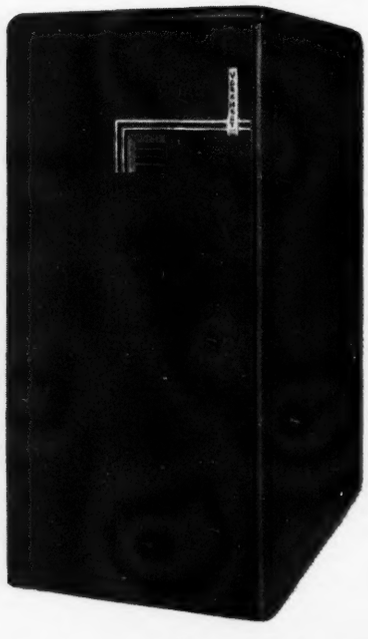
The famous patented Iris Shutter. One of the many exclusive advancements of York-Heat. Assures perfect combustion, with notable fuel-saving economy. Only York-Heat has it!

YORK-HEAT

Division of YORK-SHIPLEY, Inc., YORK, PA.

Member Oil Heat Institute of America





Hitch Your Wagon

TO THIS STAR!...

THE oil burner dealer who holds an exclusive Silent Glow franchise in the postwar period will have a decided advantage over his competition. There are many reasons why this will be so. Here are just a few of them.

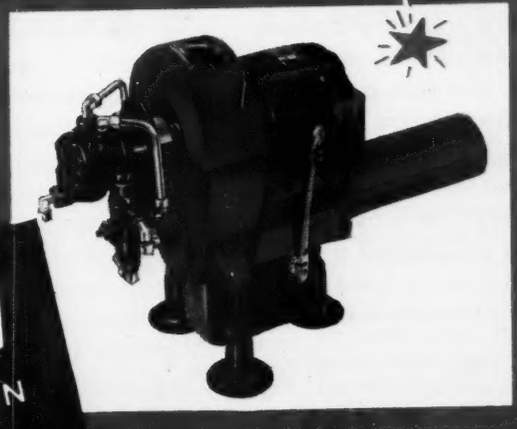
★ For more than twenty years, Silent Glow has devoted its efforts exclusively to the development and manufacture of oil heating equipment which possesses outstanding qualities of craftsmanship and durability.

★ Silent Glow holds more patents pertaining to oil burners than does any other company in existence.

★ Silent Glow offers its dealers the service of the Industry's largest corps of specially trained field service engineers.

★ Public acceptance of Silent Glow products is nation wide because they are recognized as being unsurpassed for purposes of heating, cooking, or processing. People know that when they buy a Silent Glow Oil Burner they buy more than just a fine machine. They buy responsibility, integrity, and trustworthiness which continue through the years.

If you are interested in securing a Silent Glow franchise for your territory, we suggest that you write us without delay. We shall be happy to inform you if such an opening is available. Here is a real opportunity to "hitch your wagon" to the brightest star in the oil burner field.



The SILENT GLOW
OIL BURNER CORPORATION
Hartford, Connecticut

Oilburner Limitation Order Re-Instated

WAR PRODUCTION BOARD Order L-349, effective July 11, prohibits the installation of an oilburner, except to replace equipment worn out or damaged beyond repair, or in cases where an applicant has been granted permission to become a new oil user as a result of a hardship appeal to PAW or OPA.

The new order simply revives a prohibition which was inadvertently cancelled by WPB when it repealed Order L-74. That order had been written primarily to limit the manufacture of oilburners, and secondarily to prevent their installation for new users. When it was no longer necessary to limit manufacture of burners, WPB felt that the installation clause could also be dropped, since OPA had a restriction against giving rations to new users, and PAW prohibited the delivery of oil to such accounts. They saw no reason for three Government agencies having, in effect, the same law in force.

But the repeal did not work out as planned. A number of burner dealers, once L-74 was repealed, construed the move as a lifting of restrictions generally, and in the past 60 days have sold and installed burners for homeowners who had just been waiting for the happy day when they could stop shoveling.

But when the buyers went for a ration, they ran into OPA's prohibition, and the fur flew, for the coal grates had already been given to the junk man along with the poker and clinker tongs, and the basement was so much brighter and cleaner with the coal bin cleared out. Some boards, naturally, gave them coupons, for they shared the homeowners indignation over the apparent conflicting agency policies . . . "and that's what we pay taxes for." So the three Washington agencies got together and straightened it out by persuading WPB to put back the prohibition.

◈

OPA Sets Pricing Methods For New Heating Equipment

ISSUANCE OF TWO NEW regulations providing manufacturers' ceiling prices for construction materials and refractories and specified mechanical building equipment was announced July 23, by the Office of Price Administration. Manufacturers' prices for the above commodities were previously covered in Maximum Price Regulation No. 188 (Manufacturers' Maximum Prices for Specified Building Materials and Consumers' Goods Other Than Apparel), Maximum Price Regulation 136 (Machines and Parts) or the General Maximum Price Regulation.

The new regulations become effective July 30, 1945.

Their titles are: Maximum Price Regulation 592—Specified Construction Materials and Refractories; and Maximum Price Regulation 591—Specified Mechanical Building Equipment.

MPR No. 591 under which heating equipment is priced provides three methods of pricing new mechanical-building-equipment offered for sale by a manufacturer for the first time after the new regulation becomes effective.

The seller of the new product is required to use the first applicable method of the three. If the first method is not applicable, he must use the second, and if the first and second are not applicable, he must use the third method.

First Pricing Method: Under the first method a manufacturer producing a new article that represents only a minor change from the old article for which a ceiling price already has been established, may use the maximum price of the old commodity as the ceiling price for the new.

A manufacturer may, if he chooses, use Method One of pricing the item when his direct costs on the new commodity exceed the costs of the old commodity by more than two per cent. This pricing method, is, in effect, approximately the same as the first pricing method the manufacturer previously could use under Maximum Price Regulation No. 188.

Second Pricing Method: Under Method Two, a maximum price for a new commodity shall be determined by applying a mark-up factor that the manufacturer is currently enjoying on sales of a comparable commodity to the unit direct cost of a new commodity. The mark-up factor is determined by dividing the approved maximum price for the comparable commodity by its current unit direct cost.

Third Pricing Method: Under Method Three the manufacturer submits production data to OPA, and OPA establishes a ceiling price for the new commodity by specific order that is "consistent with the general level of prices established under the regulation."

The new mechanical building equipment regulation continues in effect the adjustment provisions of Order B-1 under Maximum Price Regulation No. 188 for an expanded list of specified commodities. In addition, all commodities covered by the regulation are eligible for adjustment under limited conditions where the increases will be absorbed by resellers.

Both regulations provide that when an application for an eligible manufacturer for upward adjustment of the ceiling price for a commodity is received by OPA, the price agency will examine the financial data submitted with the application and weigh product price adjustment as follows:

1. Where current over-all net earnings of the manufacturer on an annual basis are below the average annual earnings for the 1936-1939 base period, the price on the commodity will be adjusted upward to give the manufacturer total cost plus a reasonable profit.

2. Where current overall net earnings on an annual basis do not exceed by 15 per cent his average annual 1936-39 earnings, but are not less than his average annual earnings for the 1936-1939 base period, an adjustment will be made in the ceiling price for the commodity to permit the manufacturer to recover total costs.

3. Where current over-all net earnings of the manufacturer on an annual basis are more than 15 per cent above the average annual earnings for the 1936-1939 base period, an adjustment will be made in the ceiling price for the commodity to permit the manufacturer to recover out-of-pocket or manufacturing costs on the item.

◈

C. D. Lyford, acting sales manager of Gas Controls for Minneapolis-Honeywell, has been appointed sales manager of the department. *C. C. Cochran* directs Heat Control sales in the Midwest, while *D. J. Peterson* has been made sales manager in the central zone with headquarters in Detroit. Both men will be assisted by *E. K. Scoggin,* named assistant sales manager of the Heating Controls division. *T. S. Carley,* formerly in Minneapolis, has been made assistant sales manager of Stoker Controls with headquarters in San Francisco.

Plan Research Center at University of Illinois

PLANS ARE ANNOUNCED by the University of Illinois for the Nation's most comprehensive research, experiment and demonstration center for attacking problems of good, low-cost housing. The University now has research residences of the National Warm Air Heating and Air Conditioning Association built in 1924, and of the Institute of Boiler and Radiator Manufacturers built in 1940.

The new project at the University contemplates a four-block area containing a $400,000 Demonstration Center and Production Yard with three blocks of test houses surrounding it. This arrangement will provide many opportunities for conducting related experiments simultaneously.

The project is planned by the Small Homes Council of the University, headed by William H. Scheick. Work will utilize the University's faculty of experts in many fields. They have had years of experience involving many home problems —architecture, materials, heating and ventilating, and home economics. The plans have been approved by the University Board of Trustees.

The Demonstration Center and Production Yard will provide unlimited possibilities for applied experiments which cannot be done in the fixed surroundings of individual research homes.

Full size structural elements may be built and tested here. Actual rooms, such as kitchens, or farm-house "work rooms," may be built and used for experiment and display.

The three blocks of test houses surrounding the Demonstration Center, and a plot devoted to a farm home and auxiliary buildings, will provide for studies of materials, construction, operation, and other problems involving small homes. Some houses will be for technical research and others will be actually occupied by families for studies involving typical use.

The Small Homes Council of the University was organized last year, and Scheick, a trained architect with extensive small home experience, was named coordinator. The council already has issued the first seven of a series of non-technical illustrated free circulars for the information of home planners and owners.

60-Year Oil Supply Predicted from Shale

OIL SHALE DEPOSITS in the Western States are vast enough to supply the country for 60 years, Michael Strauss, assistant secretary of the Interior, told the Senate Committee investigating petroleum resources. He estimated there are 92-billion barrels of oil in the shale deposits, and enough in more than three trillion tons of coal and lignite to supply the country for 1,000 years.

Mr. Strauss, whose department is currently engaged in experimenting with the production of shale oil, took the opportunity to warn that natural oil reserves are likely to disappear, and the day "may be sooner than we realize."

◈

Thornton Lewis, past president of the American Society of Heating and Ventilating Engineers died suddenly on July 4, at the age of 58, at his home, Holiday Hill, Newtown, Penna. Until recently Mr. Lewis had served as Chief of the Public Service Branch of the Army Service Forces, Washington, D. C.

Looking for a flue pipe that CAN'T RUST?

HERE IT IS! And in addition to being completely rustproof, Transite IW Flue Pipe has the other important features you'd expect to find in a Johns-Manville asbestos-cement product . . . strength . . . durability . . . light weight . . . easy handling.

It's these advantages that are making Transite IW Flue Pipe the preferred choice of heating men for venting many types of oil and coal burning domestic heating equipment, including steam and hot water boilers, hot air furnaces, water heaters, cooking ranges, etc.

Transite IW Flue Pipe is available in a wide range of sizes with a complete line of fittings. Why not give it a try on your next job?

At your distributor's—or write Johns-Manville, 22 E. 40th Street, New York 16, N. Y., for full details.

JOHNS MANVILLE JM PRODUCTS

Approved by the Uniform Building Code

Johns-Manville **TRANSITE IW FLUE PIPE**

For venting domestic oil and coal burning equipment

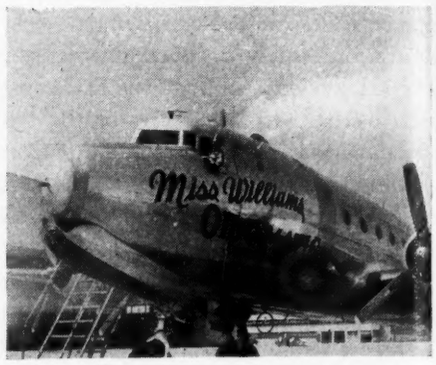
Equipment Manufacturers' Activities

York Men See New Fog Generator

YORK-HEAT DISTRIBUTORS in the East on a recent visit to the York-Shipley plant at York, Pa., were given a demonstration of the fog generator which the company has been building. This one-man machine weighs only one-tenth as much as former models, and can vaporize oil at the rate of 100 gals. per hour to blanket a square mile of combat area in five minutes. It is believed that the machine has peace-time uses in farming, fruit growing and motion picture production.

Oil-O-Matic Employees Saluted by C-54 Skymaster

IN A COMBINED SALUTE and demonstration for the men and women who help build its vital parts, a C-54 Transport and Cargo Plane roared over the Williams plant on Friday, June 22. After its initial appearance, the Silver Giant—often called the Flying Boxcar—put on a special 30-minute exhibition, stressing operations controlled by Williams-built hydraulic valves. Oil-O-Matic employes shared the thrill of this special event with directors of the Eureka Vacuum Cleaner Company, gathered in Bloomington for their first board meeting since the merging of Oil-O-Matic and Eureka.



On the nose of the C-54, largest plane built for Army transport, was lettered "Miss Williams Oil-O-Matic." The ship was flown from the Douglas factory at Park Ridge, Ill.

WHO'LL WIN the coming battle for the automatic heating market? Though competition will be keen, we think oil heat will win! It's a big opportunity, so . . .

BE READY WITH

Mobilheat

SOCONY-VACUUM HEATING OIL

Mobilheat

- **Member of America's Favorite Petroleum Product Family . . .**
- **Already One of America's Largest-Selling Fuel Oil Brands . . .**
- **Backed by Great Resources—Tremendous Petroleum Research and Marketing Experience!**

Fitzgibbons Get Steel For First 1000 Boilers

STEEL FOR THE FIRST 1000 residential steel boilers since production was stopped has been granted to the Fitzgibbons Boiler Company, according to an item in the Oswego (N.Y.) *Palladium-Times*. Sudden cancellation of war contracts had closed the plant for a short time. Boilers to be manufactured for civilian use will be 400 Series and the OE-13 to 26 of the Oil-Eighty.

New "E" Awards

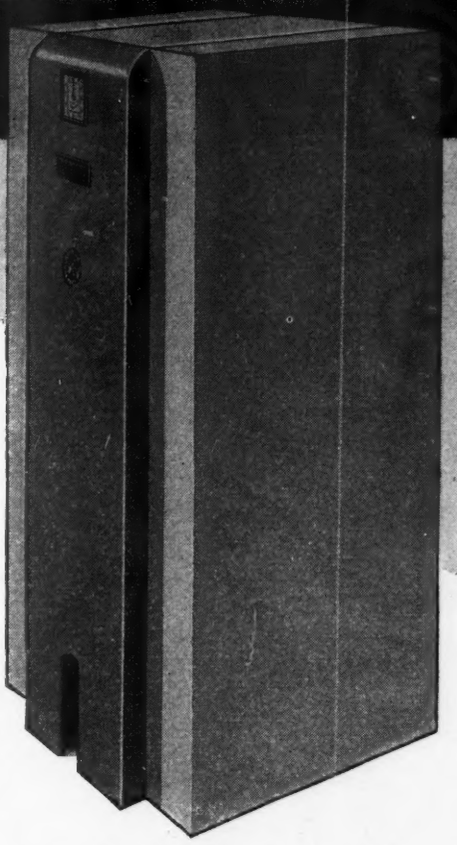
WILLIAMS OIL-O-MATIC employees were notified June 30 of the fifth granting of the Army-Navy "E" Award for excellence in war production. The first award was made in August, 1942.

BOWSER, INC., has been given a fourth renewal of its "E" award.

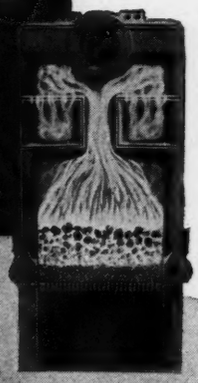
YALE & TOWNE MFG. CO., Stanford, Conn., received the third production award granted the company on July 13.

DIELECTRIC PRODUCTS CO., Jersey City, N. J., has been granted the Army-Navy "E" Production Award. Presentation ceremonies were held Saturday, July 28, at a local auditorium.

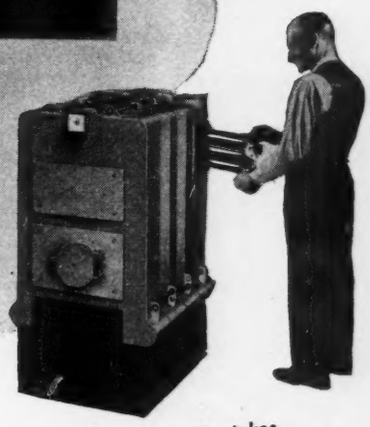
When You Sell YELLO-JACKET You Sell Peak Performance and Satisfaction



For maximum comfort and economical trouble-free service, nothing surpasses this ALL-FUEL Burnham Yello-Jacket Boiler.



The exclusive Burnham DOUBLE COMBUSTION Chamber makes the Yello-Jacket Boiler a marvel of efficiency. It materially increases the area of the direct heating surface so that more heat is delivered to the water in the boiler from the fuel burned.



The Burnham Yello-Jacket Boiler takes either the Built-In Taco Tankless Hot Water Heater or the Built-In Taco for use with Storage Tank. Either method provides an economical and unfailing source of hot water.

The Burnham YELLO-JACKET is a *quality* boiler with many outstanding features and advantages. It's the type of modern, streamlined unit a Heating Contractor can build business and a reputation on — the kind that really gives you *something* to sell.

YELLO-JACKET is an All-Fuel boiler — burns coal, oil or gas with but minor changes. In light of the painful experiences so many of your customers have had with War-Time Fuel Shortages, this is today — and will for many years continue to be — a most effective selling point.

And remember, every YELLO-JACKET Boiler is backed by the Burnham name and Burnham guarantee. Burnham's reputation for *quality* is second to none . . . with the Buying Public . . . with Heating Engineers . . . and with leading Heating Contractors throughout the country.

Burnham's Latest Development in RADIANT HEATING

Everybody is talking about Burnham's new BASE-RAY Heat Panel. Heats rooms more comfortably and attractively than ever before by *radiant rays* from a hollow, cast iron "baseboard" which extends along outside walls and is only 7" deep and 1¾" wide. It's the BIG NEWS in America's Post-War plans for heating new homes and modernizing old ones!

Burnham Boiler Corporation

IRVINGTON, N. Y., Dept. 085

Export Department

50 CHURCH ST., NEW YORK 7, N. Y.

I·B·R INSTITUTE OF BOILER AND RADIATOR MANUFACTURERS · MEMBER ·

Burnham RADIANT WARMTH SINCE 1873

fuel oil & oil heat

Shows Penn Cut-Away

WILLIAMS HEATING ENGINEERS, New York, has set up a display featuring a cut-away model of the Penn Boiler and Burner Corporation's Packaged Heat boiler unit. The model is a standard unit cut away to show details of construction. Williams will sell the complete Penn line of boiler units, furnace units, split systems and water heaters.

Smith Names Distributor

THE H. B. SMITH CO., Westfield, Mass., has appointed Dwyer-Scott Co., Rochester, N. Y., as representative for the Smith boiler line in that area. The firm is composed of John A. Scott and Jack Dwyer, well known to the heating trade, and will operate in the counties of Monroe, Wayne, Livingston, Steuben, Yates and Ontario.

Spencer Plans Expansion

SPENCER HEATER DIVISION of the Aviation Corporation, Williamsport, Pa., has started a program of plant improvement and rehabilitation which will call for the installation of three vertical core ovens; casting cleaning equipment; automatic cupola charging equipment; overhead pouring conveyors; sand cleaning equipment and three power mold conveyors which necessitated the removal of 2574 cubic yards of earth for the construction of the huge concrete pits which are 240 feet long, 13 feet deep and from 8 to 13 feet wide.

New FUEL OIL METERS
H-3C
H-3K
For fuel oil trucks, portable units, industrial burner fuel metering. For flows to 40 G. P. M. Working pressures to 125 lbs. P. S. I. Screwed connections 1-1/4" size. A small meter with high capacity.
H-3Z
Fuel oil meter illustrated with three different sets of accessories. Model H-3Z equipped with large numeral register, ticket printer, automatic predetermining set stop and air eliminator. Both strainer and back pressure valve are built into the meter. Body constructed of close grained cast iron heavily cadmium plated. Accurate, compact, simple to install. For information contact nearest representative today.
Built on the simple SMITH ROTARY PRINCIPLE–dependable, accurate and fast, the design that revolutionized the meter industry.
SMITH METER COMPANY
Subsidiary of A. O. Smith Corporation • Factory – 5743 Smithway, Los Angeles 22, Calif.
Sales Offices: New York, Chicago, Houston, Los Angeles
Local Stocks at Convenient Points
Local Agents in All Principal Cities

Socony Gives Mines Bureau Shale Oil Extraction Method

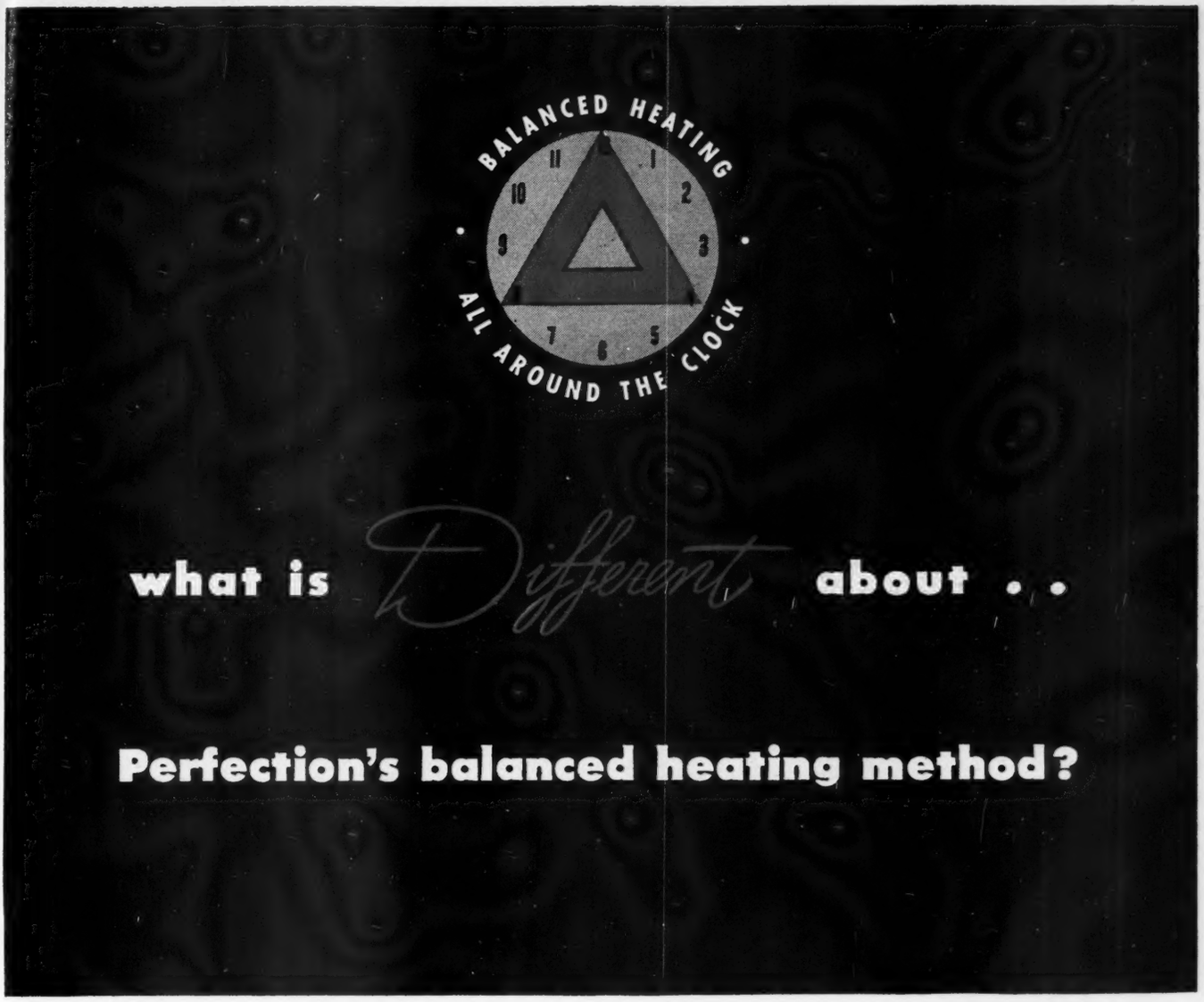
A NEW METHOD of extracting oil from shale, developed for two years by Socony-Vacuum Oil Company, has been placed at the disposal of the Bureau of Mines which has been studying the problem. The extraction employs high temperature retorts, and will produce oil at $3.75 to $4.00 a barrel. Recovery during tests ranged between 17 and 40 gallons of oil per ton of shale, the highest yield being 15% by weight of the raw shale. The variation in yield was due to different grades of shale processed.

SUN HEAT has been captured to help the house-heating system. Research at the University of Colorado has developed a successful solar heat trap that captures more than 30% of the sun's heat. The heat trap is automatic and is said to reduce the amount of heating fuel required for residences.

B. F. GOODRICH CO., Akron, Ohio, has just published an "Operators Handbook" on truck and other commercial tires. In pocket-size format, the 96-page handbook has much pertinent data on each of the company's commercial tires. Information is in condensed, easy-to-read form, and follows the description of the individual tire. An index increases reading ease.

WHEATON BRASS WORKS, Newark, N. J., has published Bulletin No. 21, illustrating and describing the Company's line of fueloil loading rack equipment and other oil handling specialties.

D'ELIA OIL BURNER Co., Bridgeport, Conn., has issued a folder on its Model FT and DXN pressure type oilburners. Featured is the Flame Tuner, an adjustable ring at the nozzle end of the draft tube which can be closed to restrict air flow, or opened to admit additional air as required. Adjustment is made by moving a lever on the side of the draft tube.



PERFECTION'S Superfex Furnace is *completely different in principle.* It provides three stages of heat—pilot, low and high fire—all *automatically controlled.* It delivers a constant flow of fresh, moving warm air 24 hours a day, the synchronized blower *adjusting its speed as needed.*

Perfection's Superfex Furnace "works" like nature itself. No jerky starts and stops—no blasts of desert-like air followed by ankle-chilling cooling off periods. The gentle, almost imperceptible movement of warm, comfortable air never stops. This *continuous* circulation of air prevents cold floors, hot ceilings—temperature variations have been held to as little as *4 degrees!* And every Perfection claim has been tested in thousands of homes.

Superfex is the Furnace you'll be hearing a lot about. Be sure to investigate it. We'll gladly answer your inquiries.

Superfex FURNACES

PERFECTION STOVE COMPANY

7798-A Platt Avenue • Cleveland 4, Ohio

A COMPLETE LINE OF WINTER AIR CONDITIONING FURNACES FOR OIL AND GAS

fuelfoil for oil heat

Reader's Problems

Q. We are installing radiators about 40% larger than the original radiators in each of seven underheated rooms in a building which has a total of 48 rooms. This increases the standing radiation load on the boiler by 382 sq. ft. The total load will be 4,342 sq. ft. standing steam radiation plus an indirect water heater hooked to a 300 gallon tank. The boiler, with 28.5 sq. ft. of grate area, has exceptionally good flue design for a cast-iron heating boiler. Fired at 13 gph to carry the increased load, it should be more than tolerably efficient. A man with 35 years of heating experience now says that I'll increase the oil consumption, instead of decreasing it as I promised the manager of the building, by installing the additional radiation in the cold rooms. He says that more radiation takes more fuel, plain and simple, and that taking the chance of overloading the boiler also makes for waste of fuel. Will you please tell me what to expect, an increase or a decrease in the fuel bills?

T. L., *Trenton, N. J.*

A. If the 41 rooms which had the proper amount of radiation last winter were overheated at all because the burner was worked overtime to heat the seven underheated rooms, then you very definitely will save fuel by installing the additional radiation. It is likely that the seven rooms which were short of radiation were kept more or less comfortable. From now on, they will be easier to heat. Therefore it should not be necessary to run the burner for as many hours a day during cold weather.

On the other hand, most of the building may have been heated to only 70° last winter, and the poorly heated rooms may have been about 60° or 65°. After you make the improvements, the rooms which always were well heated may continue to be heated to 70°, but the seven troublesome rooms may be well heated for the first time. In that event, the fuel consumption may possibly increase slightly. After all, if your changes give more heat to seven rooms but do not affect the temperatures of the other 41 rooms in the building, providing the additional heat for the seven rooms may take a little more oil.

Consider two aspects related to the location of the room thermostat: First, if the thermostat is in a room which you are fitting with 40% more radiation, certainly there will be considerable oil savings from now on. Second, if the thermostat is one one of the other rooms, where you are not providing larger radiators, to save oil you'll have to tell the building manager to set it a few degrees lower from now on; it's possible that you can say that from now on the thermostat should be set lower in view of the fact that there will be an abundance of heat, even then, in the rooms which once were too cold.

ROCHESTER UNIVERSAL GAUGES
To Meet Your Service Requirements

Our thirty years have been packed with experience in design and manufacture of Gauges, predicated on the needs of the industries we serve. Every gauge we build is made to meet the particular requirements of the service it is to receive.

Dual Dial Means Easy Reading

That's why Rochester Universal Gauges are built with dual dial because the owner wants to read it in the basement while the delivery man wants to read it outside. That's why dial rotates through 300° arc . . . long enough so that large, well-spaced figures and graduations can be easily read at a distance.

Leakproof Construction— No Fuel or Fumes Escape

Fume and fuel escape through the gauge can be a danger as well as a nuisance. That's why Rochester Gauges are leakproof — dial being separated from tank interior by solid metal casting. This also means the dial retains its original color throughout its long life, because there are no leaks to discolor it.

Rochester Universal Gauges for basement type fuel tanks are obtainable from your jobber. Ask for Rochester Gauges.

ROCHESTER MANUFACTURING CO., INC.
8 ROCKWOOD STREET ROCHESTER 10, N. Y.
Makers of Fine Gauges — "For the True Inside Story"

ROCHESTER *Individually Calibrated* **GUARANTEED ACCURATE INSTRUMENTS**
FOR ACCURATE LIQUID-LEVEL, PRESSURE and TEMPERATURE INDICATION

Q. I want to discard a coal-fired pot-stove, now heating a 200 gallon tank, and connect an indirect water heater to the steam heating boiler.

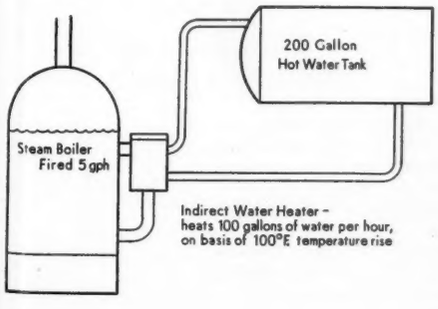
The owner of the building once was connected with the heating industry and has one big technical objection to my plan. He says that whereas the boiler size matches the heating load now, adding the indirect water heater would overload the boiler. He declares a 200 gallon hot water tank is a big load, which can't be hung on a heating boiler without the boiler's noticing it. The boiler is fired 5.0 gph now. The tank provides hot water for eight adults normally occupying the building, and on rare occasions for two or three guests in addition. Domestic laundering uses hot water once a week. Dish washing requirements for hot water are the usual for eight occupants.

How do I figure exactly the additional load that a good-size indirect water heater would place on the boiler? How much should the firing rate be increased? How much oil would be used per day in summer for heating the water?

A.D.S., *Brooklyn, N. Y.*

A. As you have not selected the water heater but mention one of good size, we will suppose that you will install an indirect heater rated to raise the temperature of 300 gallons of water by 100° F in three hours with the boiler water at about 212° F. This provides 100 gallons of water per hour, 100° rise basis.

Heating one gallon of water 100° in one hour takes just about the same number of Btu's as is given off by 3.5 sq. ft. of steam radiation (use as your figure 830 Btu, if you care to use a Btu figure for this). On this basis, the indirect water



heater we recommend would, when working at full output for one hour with the boiler steaming, provide 100 gallons of hot water and place a load on the boiler equal to 350 EDR. The addition of an actual load of this amount would call for increasing the firing rate of the burner by .6 or .7 gph. Thinking in these terms, the owner may be understood when he raises the question about possibly overloading the boiler, although a stack temperature check-up would be needed to find out if firing 5.7 gph instead of 5.0 gph would cause the boiler to be inefficient.

Actually, however, the water heating load placed on the boiler by this indirect heater is not equal to heating 100 gallons of water per hour, because 2,400 gallons of hot water are not used per day in this building. Eight occupants could not possibly account for the use of half that much hot water. You can figure that on a day when the hot water load is normal and typical, each of the eight occupants will account for 15 gallons of hot water in 24 hours. Usually, 120 gallons of hot water will be used per day.

Now, the hot water tank smooths out the water heating load on the boiler and in effect distributes over about ten hours (out of the 24 hours in a day) the load of heating the 120 gallons of hot water

add a SILOO PROFIT to every service call

There's an extra profit waiting for you on every service call. Any customer will gladly pay the small charge for a SILOO treatment because it assures free flow of oil and maximum operating efficiency.

SILOO is the quick, easy positive treatment for the cleaning of fuel oil tanks and heating equipment. It is a nationally advertised product of fourteen years standing, developed as an antidote to clogged oil filters, pipe lines and burners.

SILOO also keeps the entire fuel system free from water, removes polymerized gum and acts as an inhibitor against electrolysis and rust. Get the SILOO habit. You'll be amazed at the increase in profits and the decrease in free service calls. Non-explosive—non-inflammable—meets all fire underwriters' specifications. Write for dealer proposition.

PETROLEUM SOLVENTS CORPORATION
General Offices: 331 Madison Ave., New York 17, N. Y.

usually used per day. This means that while it heats water, the heating boiler heats an average of 12 gallons per hour. (Heating 12 gallons per hour for 10 hours provides 120 gallons of hot water per day. We are figuring that during a total of 14 hours out of the 24 hours in a day the boiler, though hot in winter, carries no water heating load because the hot water tank is about as hot as it can get and therefore the transfer of heat from the boiler to the tank is at zero. Actually, the tank may distribute the load better over 24 hours than we are figuring, with the result that the usual water heating load on the boiler, figured on a per hour basis, is lighter than we indicate.)

According to this basis then, the usual load placed on the boiler by the indirect water heater is 12 gallons of water heated per hour. Use of the 3.5 factor explained earlier renders this equal to an EDR load on the boiler of 42 sq. ft. of steam radiation. On a standing radiation basis, this amounts to connecting to the boiler one additional cast-iron radiator rated at 28 sq. ft. (allowing 50% for piping and pick-up to turn the standing radiation load figure to terms of EDR at boiler nozzle). This additional load is truly negligible for a boiler being fired efficiently at 5.0 gph and carrying, we should judge, a heating load of perhaps 1,500 to 2,200 sq. ft. of standing steam radiation. Even if you triple the estimated increased load to allow for the few days on which a few hundred gallons of extra hot water may be used in laundering and by guests, the upshot is that the additional load placed on the boiler by the water heating is still negligible and calls for no increase in the firing rate. On a winter's day, the burner will run a few seconds more during each of its regular "on" periods, during the hours that the indirect heater is raising the tank temperature, and the burner and boiler will behave as though the radiation load were greater by the slight amount which is indicated by the above computations.

Regarding summer oil consumption: Our judgment is that with an extremely efficient summer-winter water heating arrangement about five gallons of fueloil will be used per day in summer for heating water. To be extremely efficient, the installation must have excellent insulation on the boiler and hot water tank, proper size water circulating lines and good circulation for heating the water, a proper size indirect water heater, and a tank temperature control which will keep the oil burner idle in summer when the hot water tank is sufficiently warm. The boiler temperature control and the tank temperature control used for summer operation must be installed and adjusted for maximum fuel economy. If the installation lacks these features and the result is just ordinary efficiency for summer operation, we would judge that 10 to 12 gallons of oil may be used per day to heat water in summer.

◈

Q. Can a kink in a 3/8" copper tube suction line, in the basement where the line enters the building, be responsible for the burner's losing its prime quite a few times a winter?

R. I. S., *Jacksonville, Fla.*

A. It might be, especially if it reduces the inside area of the copper tubing to less than half of the original area. To find out for certain, apply a vacuum gauge to the pump, screwing it into the strainer at the pump inlet or any opening that will

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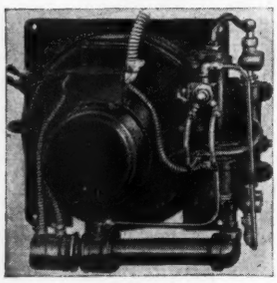

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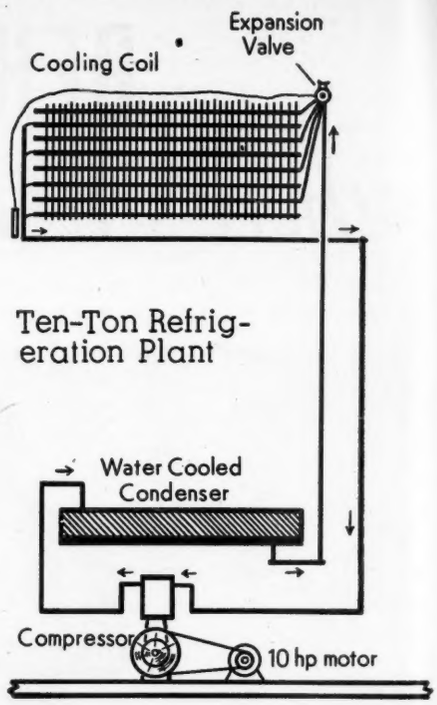
show how much vacuum is developed at the suction side of the pump. Obtaining a reading higher than 10" with the burner running normally will tend to confirm your suspicion that the kink is causing trouble, but if the vacuum gauge shows less than 10" don't blame the kink for the loss of prime.

With a very long suction line or the tank located considerably below the level of the burner, a reading higher than 10" may be obtained even without a kink in a suction line.

We gather that you are writing about an outside tank installation. It should have a return line. If it has not, probably you can blame the trouble on the need for a return line and stop worrying about the kink in the suction line.

◈

Q. Attached sketch shows a ten-ton Freon refrigeration plant used for air conditioning. During the Freon shortage, I took a chance and switched from Freon to Methyl Chloride. Cooling capacity dropped slightly, but general performance improved. Expansion valve freeze-ups, experienced with Freon, ended with the switch to Methyl Chloride. On starting automatically after a long idle period, the compressor pounded badly when Freon was used (although the solenoid valve in the liquid line and close to the expansion valve closed tight with the machine idle) but with Methyl Chloride the compressor starts smoothly.



The question is: Should I switch back to Freon now that it is again available?

Also, I think that by mistake five pounds of Freon recently was added to the 40 lbs. of Methyl Chloride in the system. Will damage result from operating a few weeks on the mixture of refrigerants? Will the mixing give a chemical combination or deterioration of the refrigerants?

Don't tell me to put these questions to the manufacturer of the equipment, for a dozen manufacturers supplied the parts used in assembling this plant and each is reluctant to answer questions about it.

P. S. B., *Newark*

A. Operating with Methyl Chloride instead of Freon would understandably reduce the capacity of the system somewhat unless when you made the switch in refrigerants you (a) speeded up the belt driven compressor by about 5% or 10% by installing a new motor pulley of larger diameter, or (b) adjusted the automatic valve which feeds water to the condenser so that the condensing pressure would run about 20 psi lower with the Methyl Chloride than it did with the

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Freon. We suggest you make either change now, even if you will run the system on Methyl Chloride for only a few weeks more. Change (a) is preferable to (b), especially if it is important to avoid using excessive water to cool the condenser.

Don't worry about having added the Freon to the Methyl Chloride charge if your equipment now is operating properly. This does not cause damage or lead to refrigerant deterioration or chemical reactions. It does, however, call for changes to the expansion valve, water feed valve, and other control adjustments, and it may reduce efficiency and output somewhat, thus ordinarily it should be definitely avoided.

All things considered, you should switch back to Freon now that it is available again. From what you say, the plant was designed for Freon. Any aluminum parts in it may give a trouble-making chemical reaction with Methyl Chloride. Also, Freon is considered less hazardous with respect to its effects on the occupants of the building in event the entire charge should through accident escape into the building. True, certain systems poorly designed for Freon will operate better on Methyl Chloride. Cooling coils which give excessive pressure drop with Freon will do better on Methyl Chloride, and this holds true also for undersize suction and discharge lines.

The freezing of your expansion valve with Freon but not with Methyl Chloride is explainable. In the liquid state, Methyl Chloride will absorb considerable water and hold it in suspension, whereas Freon will not. Using Methyl Chloride, there is therefore less free moisture left to freeze in the expansion valve than if you used Freon in a system that to begin with contained the same small amount of moisture. If you switch back to Freon, take much greater care than you ever did before to evacuate the system of moisture before you charge it with refrigerant. Drain the lubricating oil. Maintain a high vacuum on the entire system, by applying a separate special high-vacuum pump to it for 12 hours before you charge the system, and if possible heat all the equipment to 80° or 90°, the hotter the better, during this time by warming the equipment room. The vacuum you apply for 12 hours should be at least 29″ mercury, measured at sea level in a U-tube mecury manometer, or within 0.5″ absolute as gauged by comparing the manometer with a barometer. After painstaking efforts to evacuate and dehydrate the system, you should have no trouble with the expansion valve freezing when Freon is used. Take definite steps to make certain that you wind up with the proper amounts of refrigerant and lubricating oil in the system. Too much or too little of either may have caused some of the difficulties you had in the past.

◆

Q. How large an air dome should be used at the output side of a double-acting steam-driven fueloil pump which develops 150 lbs. oil pressure? The pump is working slowly, at a fraction of its rated output, and on each stroke the needle of the oil pressure gauge flickers up and down so much that the real variation in the oil pressure on the nozzles cannot be ascertained. Pressure gauges last only

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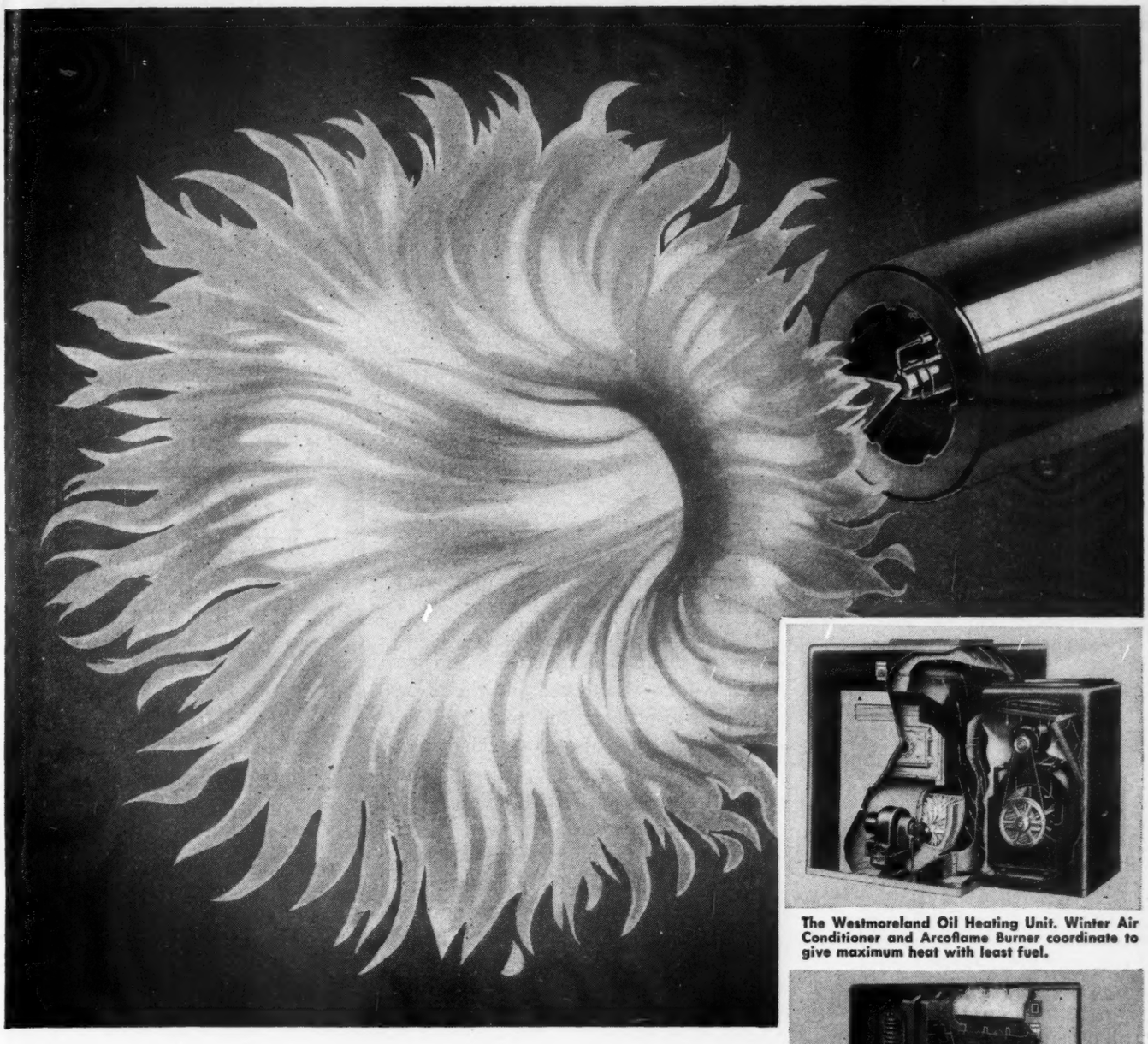
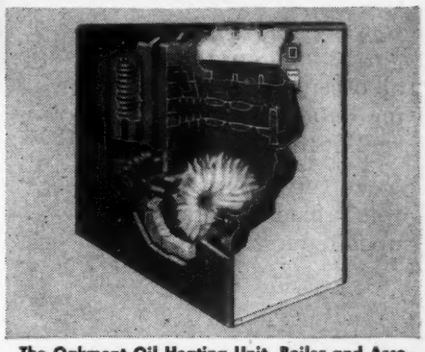
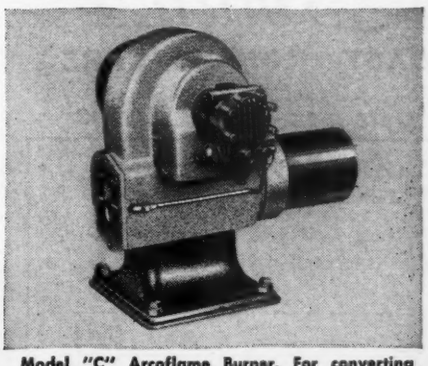


The Westmoreland Oil Heating Unit. Winter Air Conditioner and Arcoflame Burner coordinate to give maximum heat with least fuel.



The Oakmont Oil Heating Unit. Boiler and Arcoflame Burner operate as a team for top efficiency and economy.



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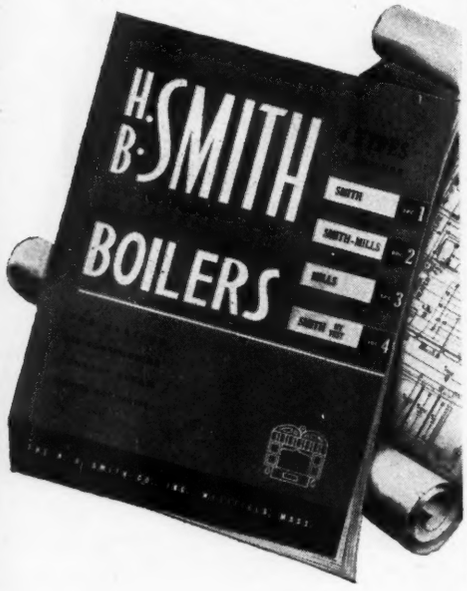

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four months because of the unsteady pressure, and combustion cannot be controlled closely.

F. M., *Detroit.*

A. The size of the air dome that should be used depends (a) on how much pressure variation can be tolerated, and (b) on how the air dome is used and the relative amounts of fueloil and air normally in it with the pump working.

Regarding the first item: A power plant operator may take the stand that he wants the oil pressure gauge needle steady and motionless because this can be arranged at reasonably low cost and gives close control over combustion. To reach the objective in that case may call for the use of an air dome several times as large as is ordinarily considered adequate.

Regarding item (b): If the pump stands idle and the air dome is full of air at zero pounds gauge pressure, and then the pump is started, the air in the dome will be compressed and the dome will contain little air and much fuel oil. Using this method of operating the pump and the air dome, for its size the air dome will be relatively ineffective. This method is frequently used, however, where for any reason the oil pressure may drop occasionally below what is normally maintained on the nozzles, as it gives no possibility of the nozzles receiving a charge of air from the air dome because of a drop in atomizing pressure.

The other method of operation, which may be used if at all times the pump can be depended on to maintain a steady pressure of 150 lbs. and if the pump seldom is stopped, consists of charging the air dome with air after the pump has been started. During normal operation, the air dome then might be two-thirds to four-fifths full of air. For its size, the dome would be highly effective when used in this manner.

Make sure your air dome is not holding more fuel oil than it should. You might install a few small valves at different levels to permit you to ascertain easily the oil level in it during normal operation.

The dome should be of five times the volume of the pump displacement, as a minimum. If absolutely steady readings from the pressure gauge are desired, and if the dome is not air-charged after oil pressure has been placed on it, you may have to install a dome several times the size that would be used normally for the oil pump. In fact, what you arrive at will resemble a pressure tank more than an air dome.

◈

Q. An oil burner once ran all right on a 10 ampere fuse. Then it started to blow fuses, one after the other, and we jumped to 20 ampere fuses. Now it's blowing them. How big a fuse is it safe to jump to, 30 ampere?

S. I. K., *Brooklyn, N. Y.*

A. It is very likely that the branch circuit which supplies the oilburner is made up of No. 14 wire. If it is, the

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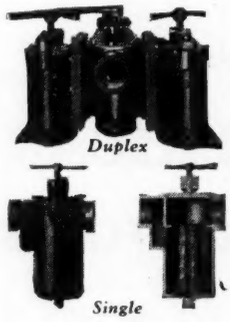

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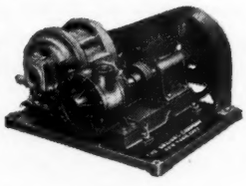

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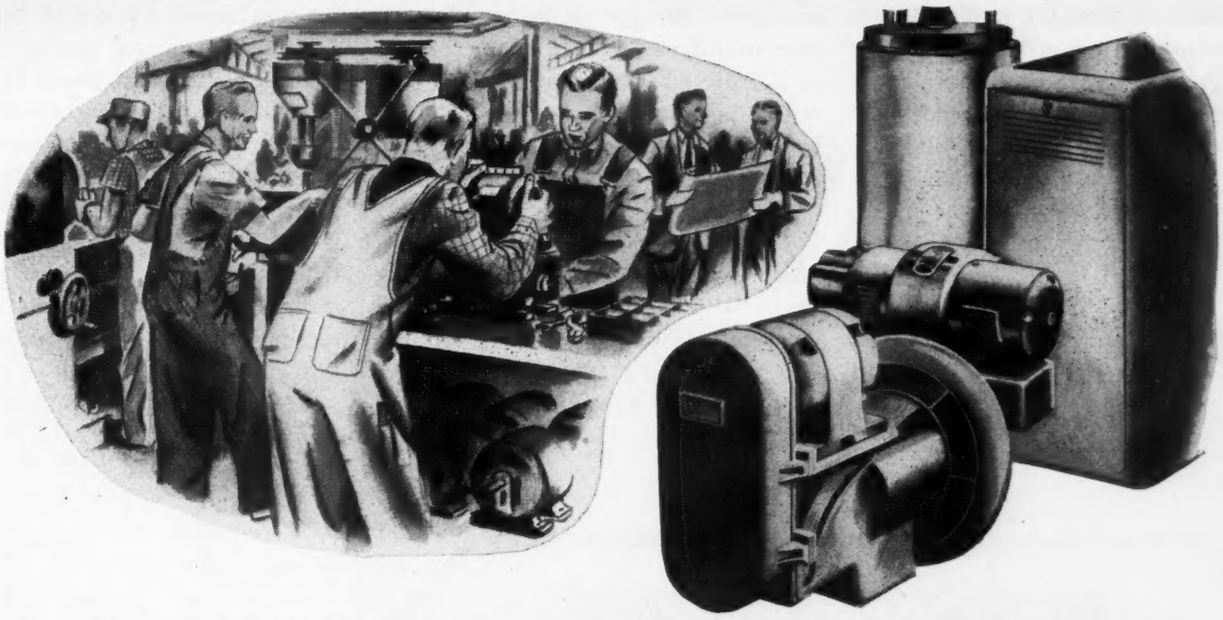

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largest fuse that should be used is 15 amp.

Switching to fuses of higher ratings is not the proper way to handle trouble related to blowing of fuses. It is not a dependable method; it is not safe. Instead, find the defect which caused the 10 ampere fuses to blow, eliminate the defect, then use 10 ampere fuses once more.

◈

Q. We plan to take out an old pressure burner used to fire a bake oven, and install a new one to provide a wider range of fire sizes. The baker will adjust the nozzle pressure for 50 lbs. to obtain a very small flame, and run up the pressure to 225 lbs. when he wants to push hard with a big flame. Can the regular fuel unit on a standard pressure burner be used to develop 225 lbs. nozzle pressure?

P. R. M., *Saginaw, Mich.*

A. Modern fuel units often are operated in the field at 150 to 200 lbs. pressure. With easily-made changes to the pressure regulating valve of the fuel unit you have in mind, probably it will serve nicely at 225 lbs. pressure. The motor of the burner will have to work somewhat harder than it would with lower pressure, but it will not be overloaded unless it is sized more closely for its usual load than are the motors of most pressure burners. Offhand, then, we would expect that your experiment of operating a typical pressure burner at 225 lbs. pressure should turn out successful. Have you thought of putting your question to the manufacturers of the fuel unit and pressure burner you have in mind?

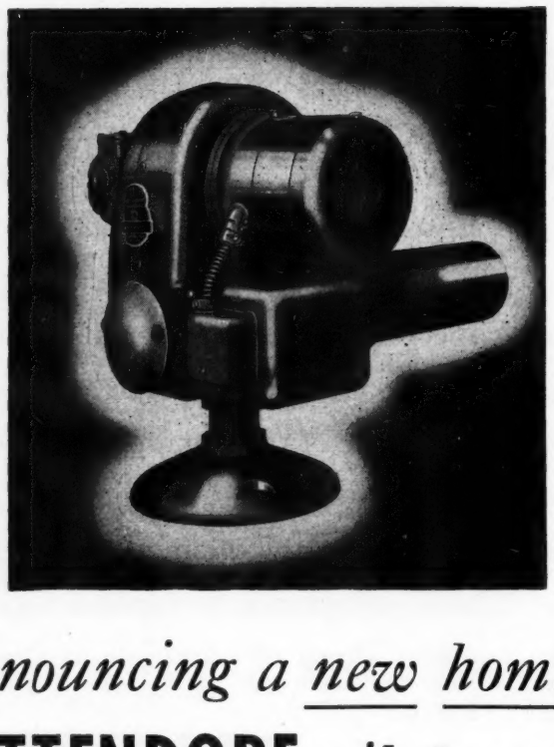
You probably realize that a pressure nozzle does not give twice the output when you put twice the atomizing pressure on it, and that shifting from 50 to 225 lbs. atomizing pressure will give you only about twice the firing rate you had to begin with. Your new arrangement might, for example, give the baker a firing rate of about 2.0 gph at 50 lbs. pressure, and a fire size only slightly more than twice that at 225 lbs. If you have not sold the burner or completed arrangements to install it, you may do well to check on the possibilities of installing a horizontal rotary cup oil burner or low pressure atomizing gun type burner built especially for bake ovens. These can give a wide variation in fire size while operating; some easily give a large flame six times the size of the small flame, for example. Also, in some the oil rate and air rate adjustments are connected together so that swinging one shipshape lever from minimum fire position towards maximum fire position gives the flame more oil and air, in balanced amounts.

◈

Q. I get different discounts, from 10% to 75%, off the list prices of the different parts I use in servicing burners, therefore I cannot fairly charge the burner owners the list prices for the parts I install. Have you suggestions which will help me make out my service bills?

A. G. S., *Boston.*

A. You might draw up your own list of the retail prices which you will charge for the service parts you commonly install. We suggest you consider charging your customers 50% more than the parts cost you; but do not take this as our definite recommendation. In effect, this would give you a discount of 33 1/3% from the retail price you decide to charge your customers. Include two items on your bills: first, for service man's time; second, retail price of the new parts which were installed.



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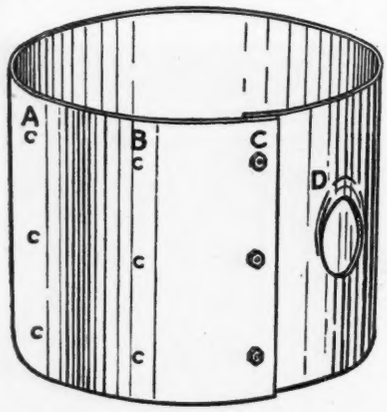

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Andrew H. Heywood has been appointed manager of the Motor Application Department of the Westinghouse Electric Corporation, East Pittsburgh, Pa., according to *Leon R. Ludwig*, manager of the Motor Division.

Mr. Heywood joined Westinghouse in 1926 after being graduated from Northeastern University, Boston, Mass.

E. T. Nahill has been made district manager for Pennsylvania, southern New Jersey, Maryland, Delmarva peninsula, District of Columbia and Virginia, for York - Shipley, Inc. Mr. Nahill has been associated with the oil heating and air conditioning industry for the past nine years.

Homer Addams, president of Fitzgibbons Boiler Co., Inc., was reelected president of Steel Boiler Institute at the recent annual meeting. *R. B. Dickson*, president of Kewanee Boiler Corp., is vice-president and *J. R. Collette* manager of sales for Titusville Iron Works, was elected a member of the Executive Committee.

Charles R. Collins, general sales manager for May Oil Burner Div., Geroter-May Corp., Baltimore, has been elected president of Maryland Industrial Marketers.

W. Marshall Dale has been appointed executive vice president of Bowser, Inc., it is announced by *R. Hosken Damon*, president. Dale resigned as president of the Indiana Service Corp., in Fort Wayne, Indiana, to asume his new position. Prior to joining that corporation in 1935 he was Vice President and Treasurer of the Public Service Company in Indianapolis.

Guy G. Smith has been appointed promotional director of the Youngstown Equipment Co., Boston, Mass., *Samuel Dane*, vice-president has announced. Mr. Smith has long been connected with promotional activity of New England utilities. The company is handling York-Heat oilburning equipment.

Lou Staff, president of Petroleum Solvents Corp., has announced the appointment of *Harry Lee* as sales promotion manager. His most recent connection was eastern sales supervisor for the Sinclair Refining Co. He will assume charge of sales promotion and advertising for all divisions.

Paul Zimmerman, vice-president and sales manager for Airtemp, has resigned to become executive vice-president of Monitor Equipment Corp., and vice-president of the management committee of T. K. Quinn, Inc. He also was founder and president of Indoor Climate Institute.

Joseph A. Kelly has been elected vice-president in charge of domestic sales for Cities Service Oil Co., N. Y. A native of Massachusetts and a graduate of the Massachusett's Institute of Technology and Harvard Graduate School of Business Administration. *Mr. Kelly* has been with this company for twenty years.

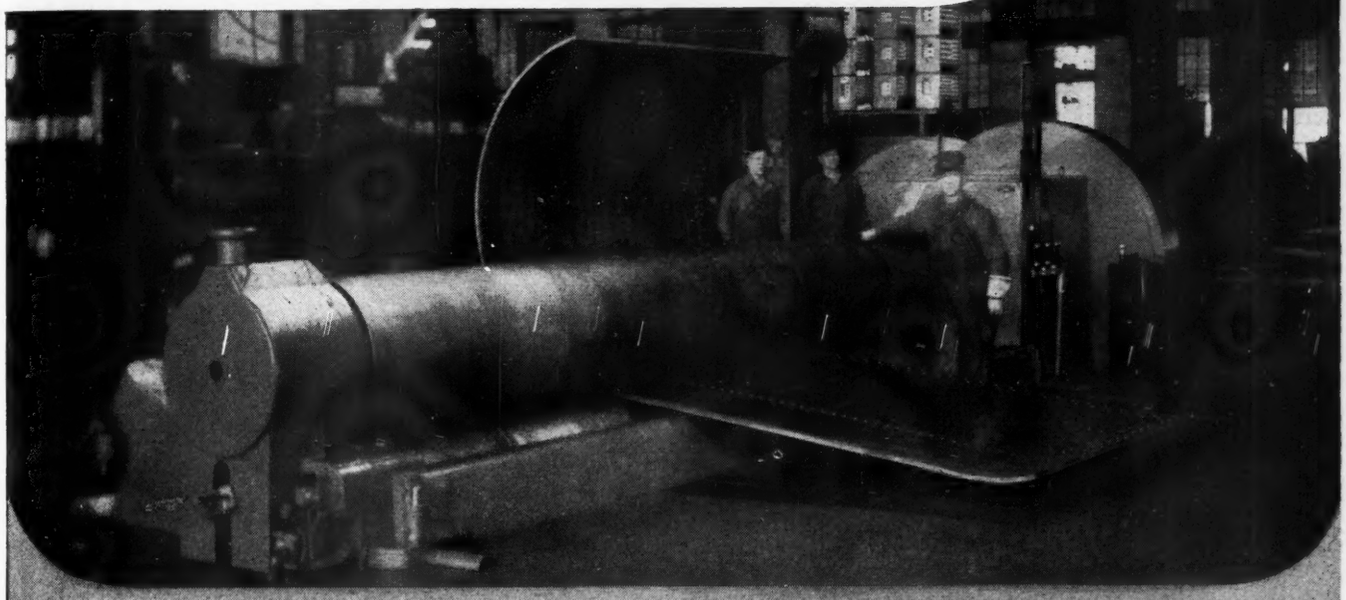
E. M. Smith, formerly manager of the Penn Electric Switch Company's Detroit office, has been transferred to the home office at Goshen, Ind., to manage the sales branch covering Northern Indiana, part of Western Ohio and Southwestern Michigan, according to *R. H. Luscombe*, sales manager. *G. Orr Sanders* recently was employed to succeed Mr. Smith as manager of Penn's Detroit office. Sanders was formerly manager of the Capitolaire Division of U. S. Radiator Corp. in Detroit

Sanders

Kyle

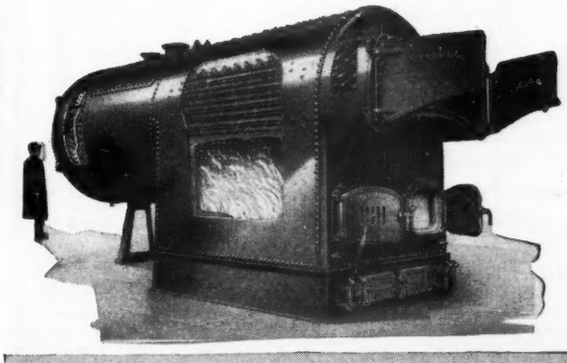
and was connected with Mayflower Air Conditioners as a factory representative. *E. S. Kyle* has been engaged by Penn to manage the Company's new branch office which was established on July 15, at Milwaukee, Wisc. Before joining Penn, Kyle was in the experimental department of Cleaver-Brooks Co., Milwaukee.

INCH THICK STEEL PLATE ROLLED INTO CYLINDERS FOR...



KEWANEE Heavy Duty STEEL BOILERS

For Heating, Power and Process Steam



That rugged strength which adds extra years of life to Kewanee Boilers doesn't just happen . . . it is *first "engineered" then built into them* in the Kewanee Plant by America's top boilermakers.

Proper design and proportioning . . . resulting from 75 years of boiler building . . . make every Kewanee a fuel saver.

Hand or Mechanical Fired
100, 125, 150 LBS. W. P.
10 TO 304 H. P.

ARMY E NAVY

KEWANEE BOILER CORPORATION

KEWANEE, ILLINOIS

Branches in 60 Cities—Eastern District Office: 40 West 40th Street, New York City 18

Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

75 YEARS BOILERMAKERS

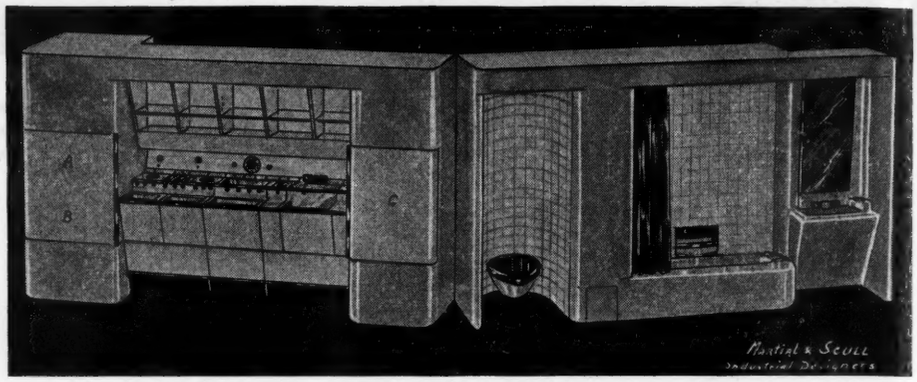
fuel oil & oil heat

Prefab Kitchen-Bath Unit Includes Heating, Cooling

A PREFABRICATED UNIT which combines a kitchen and bathroom back-to-back has been designed by Martial & Scull, industrial designers, New York. The design includes heating and cooling, both for domestic refrigeration and air conditioning, within the prefabricated unit. According to Robert C. Scull, a pioneer in prefabricated house design, all piping connections would be centrally located, making for simple servicing and low piping costs.

The unit may be fabricated out of formed metal and finished in attractive colors which harmonize with the rest of the house.

As presently designed the oil or gas fired heating unit is located behind a panel on the left side of the kitchen with the cooling compressor directly above it. Distribution of the warmed or cooled air would be through the same duct system. Domestic refrigeration will be provided in a matching unit at the right side of the kitchen.



Prefabricated *utility unit for the postwar house which provides an air conditioning unit behind the kitchen panel at "A", a heating unit at "B", and a domestic refrigerator at "C".*

All instruments and controls for the heating and air conditioning units are enclosed behind the left panel door.

Cabinet space is provided above the sink and range. There are other interesting features of design, such as the sloping range and sink units to allow for leg room.

The accompanying illustration shows a spread out view of the unit, but in its installed form the kitchen and bath units would be back-to-back. The air conditioning unit is located behind the left panel at "A" and the direct fired heating units will be behind the same panel at "B". The domestic refrigerator is at "C".

◈

Herbert B. Nottage has been made research associate on the staff of the Research Laboratory of the American Society of Heating & Ventilating Engineers at Cleveland.

F-L-A-S-H

Government warns home-owners that oil will be heavier this winter—necessitating adjustment of furnace and burner.

KLEEN-FLO

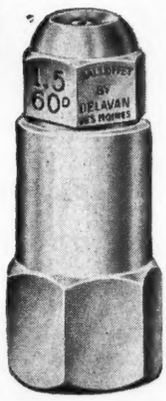
Will Help YOU Solve Today's Added Oil Burner Problems

BY simply adding KLEEN-FLO fuel oil conditioner to the tank you help attain peak performance. KLEEN-FLO helps clear dirty oil fires — smoky chimneys — carbon deposits, all of which means better and more complete combustion —and fewer adjustment and cleaning jobs for you. One quart conditions five hundred gallons of oil—simply add through oil fill line. Write today for profit making facts.

COMBUSTION UTILITIES CORP.
1451 Broadway, New York 18, N. Y.
Los Angeles office:
Suite 1119—742 South Hill Street

BALLOFFET NOZZLES NOW BY DELAVAN

Delavan has been exclusively licensed (under the Balloffet patents) to manufacture and sell Balloffet nozzles. Deliveries are now being made as rapidly as our war production permits. Send in your orders NOW.



Sales Engineering Representatives

Balloffet Dies and Nozzle Co., Inc., Guttenberg, N. J.
Delavan Engineering Co., Des Moines, Ia.
Garland-Affolter Engineering Corp., Seattle, Wash., Portland, Ore., San Francisco, Calif., Los Angeles, Calif.
B. A. Peterson Co., Dowagiac, Mich.
Rocke International Corp.—Export., New York, N. Y.
Charles B. Soper Co., Boston, Mass.

DELAVAN Engineering Co.

DES MOINES, IOWA

DE C

Take it from me!

Century is planning some real oil heating equipment for the post-war market!

Today, Century and its employees are working long hours turning out vital bomb fuses and other essential war equipment. But new and startling plans are going forward toward the day of total victory and reconversion when the post-war line of Century oil heating equipment will be available to you. Wise, alert distributors and dealers can be sure of quality merchandise at profit-producing prices with Century's new oil heating units. Technical skill and knowledge gained through wartime manufacturing will be reflected in improvements and modernization. Watch for important developments in Century oil heating equipment!

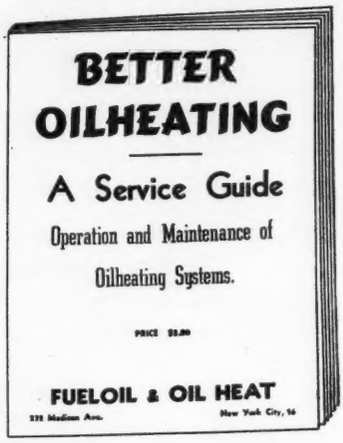
ARMY E NAVY

CENTURY ENGINEERING CORP.

CEDAR RAPIDS, IOWA

OIL BURNERS • BOILER-BURNER UNITS • WARM AIR FURNACES
HUMIDIFIERS • WATER HEATERS • AIR CONDITIONING

A NEW BOOK ON BURNER SERVICE!



A USEFUL REPRINT VOLUME OF THE BEST MATERIAL THAT HAS BEEN PRINTED

This collection of articles from Fueloil Journal, Air Conditioning and Oil Heat and from Fueloil & Oil Heat covers trouble shooting, field repair, and efficiency testing to save oil. It is a valuable book for individual study or as a supplementary text for service schools. For all dealers, service and installation men.

TYPICAL CONTENTS:

Fireboxes: First-Rate Fireboxes — Facts about Fireboxes—Hot Flames
Draft: Solving Draft Problems
Wiring: Locating Wire Defects—Handling Electrical Trouble
Motors: Keep 'em Rolling (Parts I and II)
Controls: Principles of Electric Relays—Motor-Starting Relays—Electrical Test Benches
Nozzles: Handling Nozzle Trouble—Bench Tests for Nozzles
Pumps: Handling Oil Pumping Trouble—Service on 2-Stage Pumps—Service on Automatic Valves—Service on Pump Glands
Baffles: Proper Baffles Save Oil—More Heat per Gallon
Efficiency: What CO_2 Means—Brass Tacks of Combustion Testing—What? No Instruments?—Know CO_2 from IOU—Five Ways to Figure GPH Rates—Effects of Firing Rate on Cost
Heating: Shortcuts to Heat Loss Data—It's all in the Venting

Bound in heavy paper cover, 8½" x 11". Nearly 100 text pages and 125 illustrations besides numbers of tables and short service hints.

Price $2.00 per copy.
(We pay postage)

Please send check, money order or cash with order to avoid bookkeeping on the thousands of small orders we must handle to service the field.

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FUELOIL & OIL HEAT
232 Madison Avenue,
New York 16, N. Y.

Send me.....copies of "BETTER OIL HEATING." $.....is attached.

Name .....

Street .....

City..... State.....

Industry Groups

Activities of local and national industry associations will be reported monthly in this department. Secretaries are invited to send reports of their group's activities, to reach us by the 20th of the month.

OHI Directors Expect More Burner Production

INCREASING MONTHLY OILBURNER production is expected to reach the allowed 10,000 per month by the last quarter of this year which will make it the first quarter in which the quota actually has been produced, A. E. Hess, managing director, told the Board of Directors of Oil Heat Institute at the July 24 meeting in New York. Mr. Hess also reported that some relief might be expected from the active gas sales campaigns that have plagued the industry in spots such as Philadelphia, St. Louis, New York and Indianapolis. He asked that evidences of active gas competition in any territory be sent immediately to the New York headquarters, where appropriate action will be taken.

Board members were shown a drawing of the suggested prototype oilburner which has been developed by the Engineering Committee, and authorization was given the committee to proceed with detail drawings. Frank Faust, chairman of the committee, also reported on the progress of the work of testing cracked oils, and said he expected that all the test work would be completed before the end of July.

C. R. Jonswold, chairman of the Distribution Division, asked that ways and means be found to make the use of the OHI emblem available to individual dealer members of the local chapters. After discussion, a proposal to authorize use of the seal was voted down, and President Matheson was authorized by resolution to find how and under what conditions it was advisable to make the seal available to dealers. Mr. Matheson asked Mr. Jonswold and W. A. Kemp, chairman of the Accessory Division, to meet with him to explore the problem so that a report could be made at the next directors' meeting. It was pointed out that dealers affiliated with member chapters were not themselves OHI members, and therefore were not eligible to use the seal. Further, it was suggested that the seal no longer would represent a symbol for equipment, but

Right before your eyes!

CO_2

Combustion Check-up

DRAFT GAUGE

STACK THERMOMETER

FIRE EFFICIENCY FINDER

The FYRITE Combustion Test Set gives you everything you need to detect furnace conditions that waste fuel. The FYRITE CO_2 Indicator quickly shows whether the fuel receives the proper amount of air. The Stack Thermometer test shows how well the furnace absorbs the heat of the fuel burned. The unique Fire Efficiency Finder correlates CO_2 and stack temperature readings to show at a glance loss due to heat carried away in the flue gases. The DRAFT-RITE Gauge is indispensable for properly adjusting the draft.

These instruments are designed especially for the heating man's service kit. They are easy to operate, sturdy, durable, lastingly accurate. Use them now—to point the way to necessary repairs and adjustments that secure efficient fuel utilization ... and to build an ever-widening reputation for reliable, expert service.

HEATING SERVICE DIVISION

BACHARACH INDUSTRIAL INSTRUMENT CO.

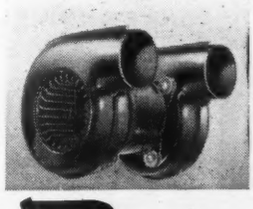
7000 BENNETT STREET • PITTSBURGH 8, PA.

RELIABLE
POWER FOR SMALL FANS AND BLOWERS

Redmond
SHADED POLE A. C.
MICROMOTORS

YOU can rely on the sound engineering in Redmond Micromotors. You can rely on their quiet, smooth operation, uniformity and long life lubrication. When a Redmond engineer specifies a Micromotor for your application, your job is being handled right. Get in touch with Redmond now for details on these reliable Type "L" AC Micromotors in sizes up to 1/40th horsepower.

Type "L" Micromotors illustrated above are 3½" in diameter, can be furnished with single or double shafts and clockwise or counterclockwise rotation.



Single or double Type "L" blower units are available for air delivery of 40 to 120 cubic feet per minute and are readily adaptable for either rigid or resilient rubber mounting.

Redmond COMPANY, INC.

OWOSSO, MICHIGAN

Composite view of Redmond facilities

AC and DC MICROMOTORS • DYNAMOTORS • SPEED CONTROLLERS • BLOWERS

rather a designation for a firm or affiliated company.

Discussion also indicated the desirability of developing a better installation code which could be offered to cities, counties and states which are revising their ordinances.

C. F. Curtin, secretary, reported that the Manufacturers' Division has received six new applications and one resignation; the Accessory Division had seven new applications and three resignations, and a new member, Oil Heat Institute of Omaha (Neb.), has been added to the Distribution Division, replacing a cancelled membership. The Omaha group is headed by J. C. Gordon, president, and P. S. Brick is secretary.

A suggestion made at the May meeting that oilburners be shipped with draft regulator, an oil filter and extra cartridge, was protested by the Chicago Oil Burner Association as an invasion of the supply house business, and asked that the suggestion be dropped. Chicago's resolution was accepted by the Board.

Mr. Jonswold said that no plans now were being made for regional meetings this year, due to ODT travel restrictions. The next meeting of the Board of Directors will be held in New York, October 9, 1945. Through this normally would be the semi-annual meeting, no formal gathering is planned at this time.

We refuse to market burners which do not meet the high standards set for the famous pre-war Herco.

The reputation for quality and performance, built-up through years of manufacturing fine oil burners, is our most valuable asset. We do not intend to endanger it by producing "wartime models."

When Herco Oil Burners are available to you once more —be assured that you're handling a "blue chip." No inferior materials or makeshift designs will ever be used in the production of Hercos.

Service in Wartime Sales in Peacetime

If you are interested in a Herco dealership, drop us a line. We'll contact you as soon as we can accept orders.

HERCO OIL BURNER CORPORATION, LANCASTER, PA.

HERCO
The Oil-Thrifty
OIL BURNER

Western States Representative:
Harold Winningham & Co.

Main Office: 1112 Second St., Seattle, Washington
Branches In: San Francisco, Los Angeles, Salt Lake City, Denver and El Paso

New York Has Outing

NEW YORK OIL HEATING Association, Inc., held its annual Outing and Golf Tournament at the Pomonok Country Club, Flushing, on July 24, with a good attendance. The dealers' soft ball team captained by Matty Conviser, beat the manufacturers, led by Charlie Triola, for the first time in years. The day of golf and contests was concluded by a dinner.

Members' golf was won by Bill Archer (Sid Harvey) with a low gross of 93, and Frank Baerenklau (Baerenklau & Co.) with a low net of 65 for 18 holes. Chas. Smith (Sunrise) and Jack Gasner (Saltser & Wienser) tied for second place with a gross of 95, and E. B. Lipsett (Socony) had the second best net of 74. Guest winners for low gross were John Schleif (Bank of Manhattan) and Wm. Hemlyn (Dreyer & Traub). Guests' low net scores were won by Henry Kuhlman (Crane) and N. Thomas (Paragon). The driving contest was taken by John Lewis at 210 yards, and the putting was won by Gred Gilbert (Patchogue Oil) first, and Phil Kane (Amber Oil) second.

A nail driving contest was won by M. Kirshner with George Scott second. The shot put (with a rubber ball) was taken by Ed Senft (Colony) with Milt Pasternack in second place.

Washington Group Holds Industry Dinner Meeting

OIL HEATING DIVISION of the Merchants & Manufacturers Association, Washington, D. C., sponsored a big dinner meeting at the Mayflower Hotel, July 25. Principal speakers were W. A. Matheson, president of OHI; D. L. Barrett, Standard Oil Company of N. J.; Carl Jonswold, chairman of the Distribution Division, and F. B. Caldwell, secretary of the Distribution Division of OHI.

Mr. Matheson urged dealers to prepare well for the selling job that is ahead of the industry, and promised a potential greater than the business ever has known in the past if dealers are ready to sell aggressively.

Mr. Barrett covered the present and

MEL *Adjustable*

FUEL-OIL GAUGES

Patented

With V-E Day behind us and V-J Day to look forward to, we don't believe that it will be long before we are allowed to fill the many orders we now have for *adjustable* MEL Fuel Oil GAUGES . . . New orders are at present being filed for delivery as soon as war restrictions are lifted.

Check These Features

MEL Fuel Oil GAUGES are *adjustable* for easy accurate readings of tank contents at all times. They are manufactured by specialists—of the finest quality heavy steel stampings. The rods are of the finest tin coated Bessemer steel and the float supporting arm is of cold rolled cadmium plated steel. The indicating knob is of easily seen red fiber and *adjustable*. The body is of *unbreakable* transparent cellulose acitate tubing and the base bushing is of cast iron with accurate tapered threads. All models have the new corrosion protected all metal rotating float.

Mel-Gauge COMPANY

EAST HAVEN, CONNECTICUT

Write Today for Your MEL-GAUGE Folder

See for yourself the many superior qualities that may be obtained with *adjustable* MEL-GAUGES. Place your orders now for early deliveries.

postwar prospects for fueloil, and Mr. Jonswold and Mr. Caldwell explained the work the Distribution Division is doing.

Wisconsin Holds Outing

WISCONSIN OIL HEAT Association, Milwaukee, held its annual golf outing at the North Hills Country Club, July 20. Grover C. Fillbach was chairman of the golf committee.

REMA Directors Meet

REFRIGERATION EQUIPMENT Manufacturers Association will observe its 10th anniversary August 15, with a summer meeting of the board of directors in Marinette, Wis. Directors will be guests of F. J. Hood, newly elected REMA president, whose company is situated there.

I-B-R Research Continues At University of Illinois

MEMBERS OF The Institute of Boiler and Radiator Manufacturers have authorized continuation of their research at the University of Illinois, revised the I-B-R Rating Code, and launched other educational activities. The contract with the University has been extended to cover the year from July 1, 1945, to June 30, 1946. Next major project will involve study of the performance of an automatically-fired one-pipe steam system which will be installed in the I-B-R Research Home this summer. Recessed radiators will be used during the first part of the test. Later a change to a radiant baseboard will be made.

Among the more important objectives of the study will be to determine if a main less than two inches in diameter can be used on a system of this size; to determine the operating characteristics of vacuum and non-vacuum types of valves for the venting of radiators; to determine the advantages of splitting the system into two circuits as compared with one circuit; to determine fuel savings effected by preventing the circulation of air through the boiler during off periods; and to determine fuel savings resulting from the use of outdoor air for burner and draft regulator.

Also included in the general objectives will be a comparison between a one-pipe steam and a hot water heating system with respect to cold 70 and the types of controls needed for best results with a steam system.

LOOKING for a POST WAR Go-Getter

This Is It!

Write for Details Paragon Oil Burner Corp. Bridgewater St. at Newtown Creek, B'klyn 22, N. Y.

LEADER in New York City Sales

PARAGON OIL BURNERS

NONE BETTER

Work at the University is conducted under the supervision of the Research Committee of which S. K. Smith, vice president of The H. B. Smith Co., Inc., is chairman.

R. L. Blanding of Taco is chairman of the Sub-Committee on Water Heating. This committee has drawn up a code for the testing of indirect water heaters. This Sub-Committee now is engaged in the preparation of an installation guide covering selection of heater and tank sizes, location of controls, connections to the boiler, location of heater, types of storage tanks, connections from heater to the storage tank, insulation, valves and drains, and tax on the heating boiler.

L. N. Hunter, vice president of National Radiator, is chairman of the Boiler Technical Committee which has prepared a revised edition of the I-B-R Testing and Rating Code for Low Pressure Heating Boilers. Copies of the new edition will shortly be available.

The Boiler Construction Code Sub-Committee has done considerable work in preparing a tentative draft of a construction code as a background for the development of standard engineering practice which would be of assistance to the members in designing boilers.

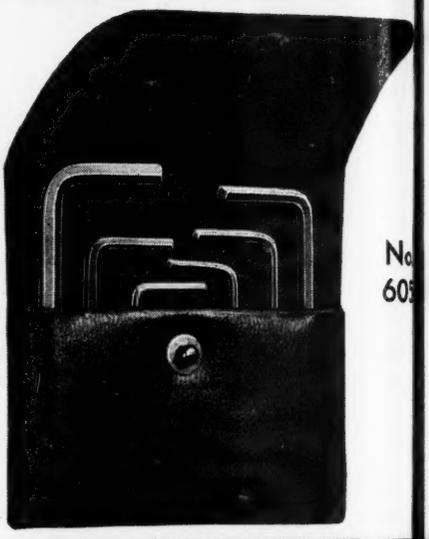
J. F. McIntire, president of the United States Radiator Corporation, is chairman of the Radiation Technical Committee. This committee has suggested that Simplified Practice Recommendation R-174 be amended to show the elimination of four-tube radiators 19 inches high and six-tube radiators 14 inches high.

The Engineering Experiment Station of the University shortly will publish a bulletin entitled "Study of Radiant Baseboards in the I-B-R Research Home," by A. P. Kratz and W. S. Harris. This bulletin will summarize the excellent results obtained during the last two heating seasons with a type of radiation which is located at the floor level and which extends, more or less, along the entire length of the exposed walls of the rooms.

◈

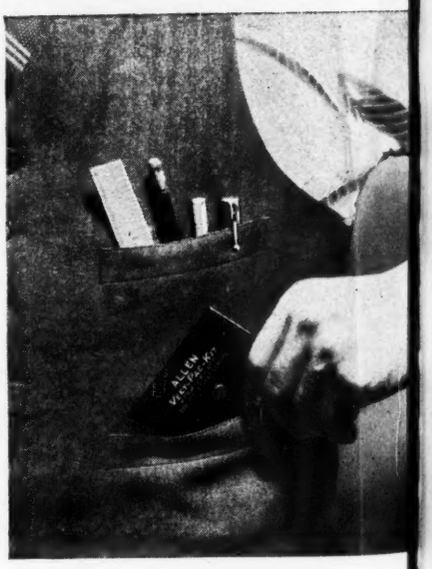
PR No. 28 explains the general policies WPB will follow in granting priorities assistance in the third and fourth quarters. General priorities assistance will not be granted for manufacture of civilian products that were forbidden by L and M orders prior to May 1.

ALLEN Key Kits



No. 605

VEST-PAC-KIT



No. 605 — Packet only 3″ x 2¾ over-all contains 6 Hex Keys to fit hollo set screws in sizes No. 4, 5, 6, 8 and 1 also ¼″ and 5/16″. Same keys fit socket he cap screws in sizes No. 4, 5, 6, 8 and 1 Most compact and serviceable little s you could ask for. List price, only 50

Ask for complete listings of Allen Hollow Screw Assortments and Key Kits. Address inquiries and orders to Dep't. M,

THE ALLEN MFG. CO. HARTFORD 1, CONN., U. S. A

14,196 DEFECTIVE UNITS REBUILT BY SID HARVEY, INC. (6 mos. period) 13,923 WERE PERFECT

SOME RECORD

We Hate Statistics, but---

A review of the Sid Harvey Repair Department for the six months ending March 31, 1945 showed that of 14,196 defective units rebuilt, only 273 failed in the guarantee period. Among them were many "dogs" and antiques.

Nothing was left out in the figuring. We even included failures caused by conditions beyond our control, such as water or acid in the oil, dirt, etc. If Sid Harvey's rebuilt it and it proved to be defective, we made good on it.

In breaking down the statistics, here is how some of the most important units shipped in this period stood up (including all models, even the very old ones):

99% Webster Fuel Units
99 1/10% Teesdale Wall Pumps
99 2/10% Regulating Valves
98 1/4% Sundstrand Fuel Units
98 1/10% Tuthill Fuel Units
98 7/10% Motors
97 6/10% Relays and Controls

QUANTITY PRICES ARE NOW LOWER
Send for BULLETIN 58.

PRIORITY CERTIFICATION NO LONGER NEEDED ON ORDERS FOR MAINTENANCE MATERIAL

Send For Catalog

SID HARVEY INC.
VALLEY STREAM, NEW YORK

fueloil & oil heat

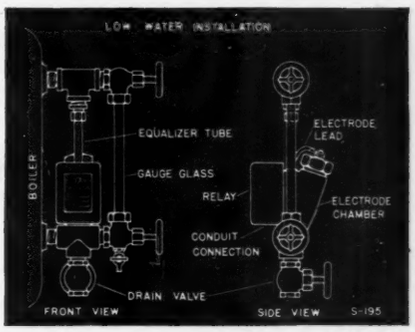
Positive Low Water Control

GENERAL CONTROLS

LOW WATER CUTOUTS

These electric low water cut-offs are free of moving parts, glands or seals under pressure, thereby eliminating greatest drawbacks of usual cut-offs. Designed to work satisfactorily on any type of water from spring water to brines. Large electrode area. Low current density insures freedom of spot currents. Low installation cost. Low and line voltage types available. Line voltage types with double voltage coils, permitting either 115 or 230 volts A. C. connections at installation.

L-2 Series



General Controls' engineers will help you fill your specific needs. For complete specifications on automatic temperature, pressure and flow controls, request Catalog 52B. Nearby is a factory branch or distributor equipped to meet your requirements.

GENERAL CONTROLS
801 ALLEN AVENUE — GLENDALE 1, CALIF.

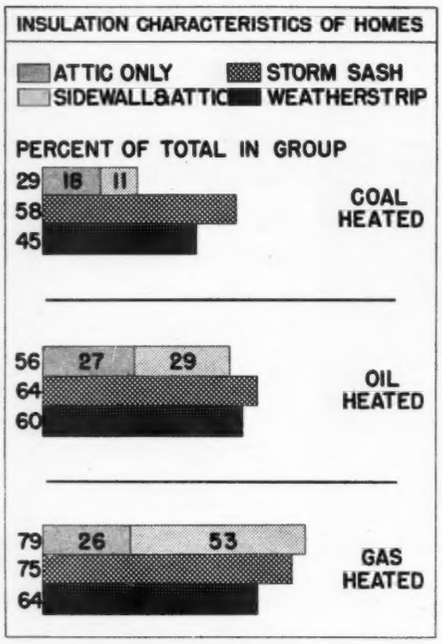
FACTORY BRANCHES: PHILADELPHIA • ATLANTA • BOSTON • CHICAGO
KANSAS CITY • NEW YORK • DALLAS • DENVER • DETROIT • CLEVELAND
HOUSTON • SAN FRANCISCO • SEATTLE • PITTSBURGH
DISTRIBUTORS IN PRINCIPAL CITIES

Consumers Talk of Fuels

(*Continued from page 40*)

tion, attic and sidewall insulation, storm sash and weatherstrips. Table VI shows the percent of homes, by sections, having each of the four fuel-saving facilities.

With 79% of gasheated homes insulated, to only 29% of those coal heated, gas gets an advantage of probably 15%, or $4 a room, in comparison with coal costs. If all oilheated homes averaged as high thermal efficiency as those gasheated, the fuel cost spread would be wider. However, the comparison of home thermal efficiencies is decidedly more favorable to oil than it would have been just before the war. Fuel shortages and good incomes have caused many oil users to insulate.



A natural question in connection with oil cost opinions would be whether people think of wartime or peacetime costs. In all probability, most gave present cost estimates, but they are not greatly different from peacetime. Countrywide, the rise in oil prices just about balances the reduced amount under rationing.

In the East, for example, 2,000 gallons before the war @ 7¢ cost $140; today 1,500 gallons @ 9¢ costs $135. Subsequent articles will show that oil cost is not much of a factor in either liking or disliking oil heating.

TABLE VI

Insulation Characteristics of Homes
(In per cent of homes)

	NEW ENGLAND			MID-ATLANTIC		
	Coal	*Oil*	*Gas*	*Coal*	*Oil*	*Gas*
Attic Only	19	26	30	10	31	28
Attic & Sidewall	5	30	40	9	26	55
Storm Sash	71	81	90	46	71	76
Weatherstrip	44	60	50	45	69	83

	MIDDLE WEST			PACIFIC N.W.		
	Coal	*Oil*	*Gas*	*Coal*	*Oil*	*Gas*
Attic Only	28	29	27	10	12	11
Attic & Sidewall	16	41	60	10	22	44
Storm Sash	77	74	82	2	..	11
Weatherstrip	47	56	60	34	38	56

Amrop Sees Good Stove Market in Latin America

AMROP TRADING CO., New York, reports that there is a "large and expanding demand" in Latin America for oilburning stoves of one, two and three burner types.

Countries where oil is produced or where wood is scarce and expensive, such as Venezuela, Colombia, Mexico, Cuba, Brazil, Chile, Peru, Bolivia, the Argentine, South Africa, Aruba and other islands of the West Indies have been taking large quantities of such stoves and the demand is far from satisfied.

Amrop also advise that there is a good demand for Top-of-Stove ovens, small oilburning hot water heaters.

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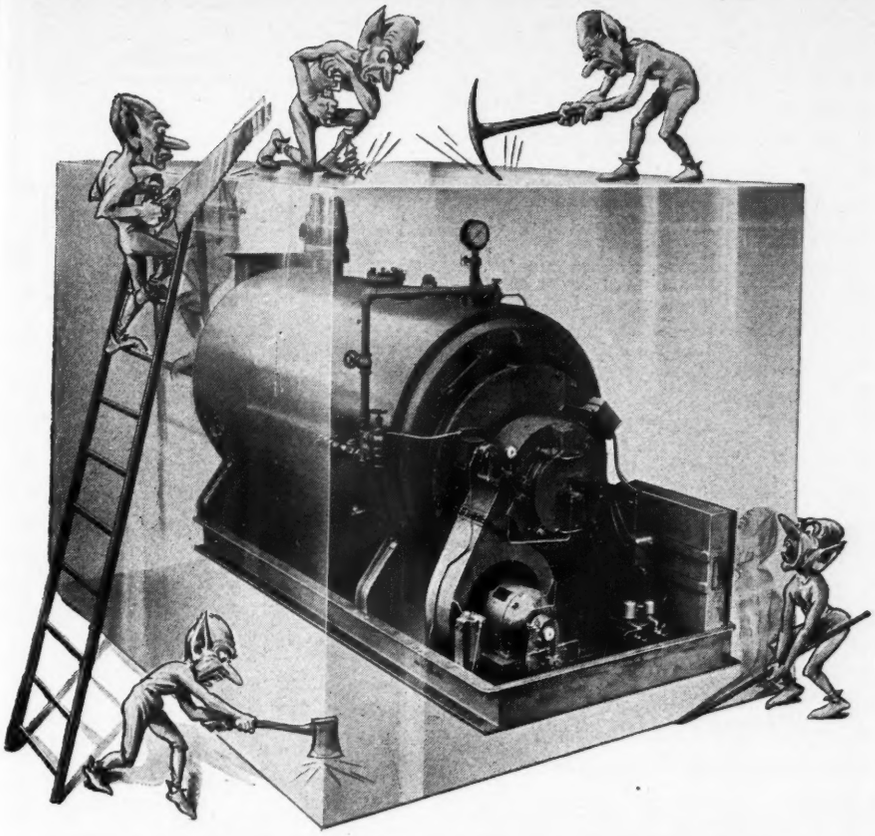

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Orders are now accepted for early delivery.

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STEAM GENERATOR

CYCLOTHERM CORPORATION
90 BROAD STREET, NEW YORK 4, N. Y.

Air Out of Place

(Continued from page 51)

not removed the same condition would occur again.

There were two other causes of high vacuum condition which caused the same trouble in a gravity feed single line job. These were shown before the trouble which would occur from the air in the nozzle line was demonstrated.

Even a gravity feed job will become air bound if the strainers are so clogged as to cause the pump to work harder and hence cause a high vacuum. The air leak would come in through the strainer cover or the seal, and there still might be no visible evidence of any leak.

The other way that a gravity feed job could become air bound even with the strainers clean could happen on fuel units that have an anti-hum orifice screwed into the outlet of the strainer. These orifices are made in several different sizes and the sizes are not marked as to what nozzles they are used on. If you should have an anti-hum orifice which would be correct for say a one-gallon job, but you had a three gallon nozzle on the burner, this small orifice would cause a high vacuum and a possibility of an air leak at the seal.

Advise Removing Orifice

Sid Harvey, Inc., advises dealers to remove these orifices entirely unless a hum condition exists, but should it be necessary to use one they will positively prevent a hum. The procedure recommended is to insert the one with the largest orifice first and in case this does not remove the hum to then take the next largest one and so on until the hum is eliminated, but under no condition put in the smallest one first because of the danger of creating a high vacuum which will cause an air leak.

This same pump was then changed to a single line gravity feed job. While this is a perfectly correct installation, it can become air bound as mentioned above.

The effect of the air in the nozzle line tioned before, which could be seen in the plastic nozzle line as a large bubble, was next demonstrated, and in order to understand what it does with different nozzle lines, two different sized lines were installed. The first one was 1/8" size, which is used on most burners in the field, and the other was the 1/2" size which is found on some few burners.

When the normal sized nozzle line was used, the bubble was seen to compress to about 1/10 of its size, and when the burner was stopped this bubble then expanded back to its original size and caused oil to be forced out of the nozzle as an after drip, but this did not indicate that the pump itself had a defective cut-off, as the after drip was caused solely by the compressed air in the nozzle line. It was also noticed that after two or three cycles of the unit that the air bubble gradually worked its way out of the nozzle and finally disappeared entirely.

The point that was brought out on this demonstration was that first you should test a pump for a clean cut-off by removing the nozzle line entirely and observing the cut-off at the nozzle port of the fuel unit, catching the oil in a can. If it shuts off properly, there should be no worry about the poor cut-off at the nozzle, provided the nozzle line is normal size, the nozzle is tight on it, and there are no difficult traps that hold the air. The cut-off will be okeh with a few cycles if air is causing a drip.

The next demonstration was to install a plastic nozzle line of 1/2" size and observe the same conditions. Everything was seen to be exactly the same as it was on the small nozzle line, except that none of the air worked its way out regardless of how many cycles or how long the pump operated. It was quite evident that should a replacement fuel unit be put on a burner which has a large nozzle line, that the line should be changed to the 1/8" size at the same time, otherwise they will never get a good cut-off under these conditions.

The importance of thorough knowledge of what air can do in oil lines cannot be over-emphasized as the oilburner industry is dependent upon customers' satisfaction. Customers will not be satisfied if their cost is high, nor if the service is inefficient.

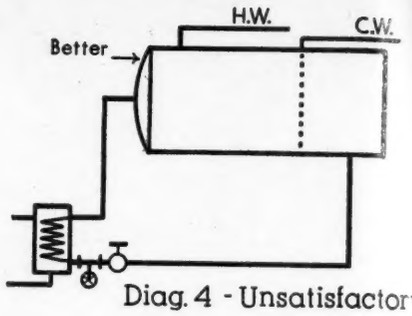
◈

Plenty of Hot Water

(*Continued from page 48*)

and hot water in the tank at times of rapid flow of hot water from the tanks.

Diag. 4 shows piping which is unsatisfactory because after the tank has chilled because of heavy load, half the water in



Diag. 4 - Unsatisfactory

the tank must be heated before any hot water can be drawn from the hot water faucets. If this is an 80-gallon tank, for example, sending 20-gallons of hot water into it after it has become stone-cold simply will give a mixture of 20-gallons of hot water and 20-gallons of cold water in the top of the tank. The result amounts to 40-gallons of cold water as far as an occupant of the building, impatient for a hot bath, is concerned. With the piping shown in Diag. 2, an 80-gallon tank will give hot water to faucets soon after a few gallons of hot water comes from the indirect heater, and sending 20-gallons of hot water to the tank will make almost 20-gallons of hot water instantly available for the faucets.

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Fig. F-80

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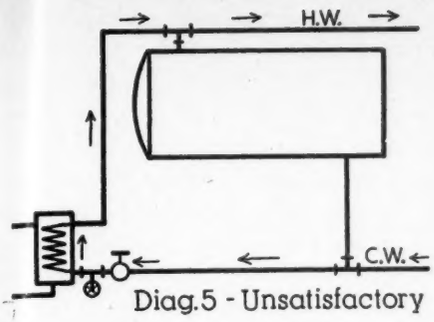

Diag.5 - Unsatisfactory

Avoid the trouble, shown in Diag. 5, of shooting cold water right through the heater coil at times of heavy draw of hot water. One quick pass of cold water through the coil of a tank-type indirect water heater will not heat the water. In other words, a tank-type water heater is not a tankless water heater. Both the tee's in Diag. 5 are in the wrong positions and are piped improperly.

To arrive at exceptional summertime fuel economy from the type of installations shown in the diagrams, provide especially good insulation for the boilers, all warm piping, and the hot water storage tanks. Rock wool two-inches thick, or equivalent insulation, makes good tank covering. For the heating boiler, use rock wool two inches thick or two inch thick slabs of 85% magnesia insulation, or equivalent insulation. Make sure, if you want exceptional fuel economy, that the storage tank and indirect heater are probably sized according to the data already given. An undersize heater or one with a clogged coil wastes oil.

Now, as your final step towards fuel economy, especially for the summer and the end of spring, and beginning of winter install a tank temperature control, a surface type will do nicely, halfway up the side of the hot water storage tank and set it for about 120°. The temperature at the top of the tank will be higher. Wire this control in series with the boiler temperature control, so that in summer the steam boiler will be permitted to chill whenever the tank temperature is high enough. Set the boiler temperature control much higher than usual, at about 180° or 200°—so high that when the burner is stopped by it in summer the boiler water is simmering. With the boiler temperature control set properly, setting it five or ten degrees higher in summer would cause the steam mains near the boiler to get warm before this control went to its "off" position. The idea of these control settings is to have the steam boiler become cool in summer when the hot water storage tank is warm enough, but to work the indirect water heater as hard as possible, without the boiler steaming, at times of heavy water heating load. Increasing the boiler temperature 20° to 30° over the usual for summertime gives a great increase in the output of the indirect heater. Thus use of these principles saves oil when the water heating load is light and when no hot water is being drawn, for at such times the considerable heat loss of the steam heating boiler is reduced as much as feasible by letting the steam boiler chill. The same principles, however, give much higher output from the indirect water heater in summer at such times as the hot water storage tank tends to chill halfway up. Oil savings amounting to half the oil previously used in summer are usual as the result of applying these principles.

The next article in this series will cover the application of indirect water heaters to hot water heating plants, and use of tankless type heaters on steam and hot water heating boilers.

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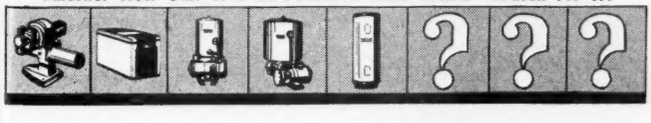

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For Vaporizing Burners

(*Continued from page 44*)

ducting evening classes in oilburner heating, and had asked me to instruct these classes in the proper installation and service on their equipment. After being introduced by the instructor in charge of the class. I told the students that questions would be welcome at any time, so long as they were related to the particular part of the demonstration under discussion at the time of their questions. One of the men in the class stood up, saying that as my talk on the furnace had not yet started, he had a question he thought was in order. He wanted to know if they were wasting their time by attending class that evening. When asked to explain more fully what he meant, he replied that his brother, who had been an oilburner service man for ten years, had told him that any time he spent on vaporizing burners was wasted, they could not be made to operate properly, and the sooner they were all replaced with mechanical burners the better off the oilburner industry would be. Upon questioning the balance of the class, I found that every man who was actually working as an oilburner service man held somewhat the same opinion toward vaporizing burners. This attitude is typical of a majority of service men, and must be expected and overcome by anyone attempting to teach vaporizing burner service, by pointing out to them how ridiculous would be the situation they are insinuating exists within the engineering departments of a number of large companies, who have always commanded a tremendous amount of engineering respect. Such companies as Chrysler, Norge, Motor Wheel, Perfection Stove, Michigan Tank and Furnace, etc., all manufacture vaporizing burners. All of the companies manufacture some other product, such as automobiles, automobile parts, refrigerators, washing machines, airconditioning equipment, electric ranges, etc., most of which are marvels of engineering skill.

Our service men, when they voice their opinion that all vaporizing burners are inherently bad, should realize that what they are actually claiming is, that when it comes to heating equipment, every one of these companies, have gone completely haywire, spent hundreds of thousands of dollars engineering, designing, manufacturing, and merchandising, vaporizing oilburning equipment, that cannot be made to operate properly. Of course, this is preposterous, as any intelligent service man, realizing his own lack of knowledge of these burners, must admit.

That this attitude does exist anyone can prove to his own satisfaction if he will merely ask a dozen service men what they think of vaporizing burners.

The service manager of the company that probably has more vaporizing burners under service than any other company in the country, claims that because of this firm conviction on the part of experienced service men it takes at least a year to make good vaporizing men, because doubt and skepticism must first be

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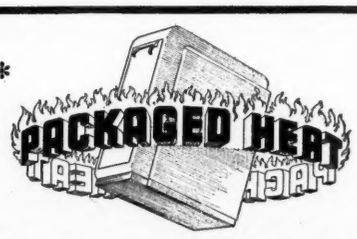

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driven from their minds, not by words but by actual experience. Yet he claims he can take an inexperienced man and within a period of a few weeks, make him a crackerjack vaporizing man, simply because the mind of a new man is not filled with false impressions and misinformation.

The purpose of this article is not to condemn service men for their inability to make these units operate properly, because frankly it's not all their fault. Even if a service man wished to know more about vaporizing equipment the necessary information is not readily available to him. Service managers seem to know little more of these units than the service men themselves. Proof of the lack of training programs on the part of service organizations is the statement of this same service manager who claims that never once has he interviewed a prospective employee who truly understood vaporizing burners. Every man they had ever hired had to be trained. Our service manager recently interviewed a man who had worked a number of years for a company that had installed over three thousand vaporizing furnaces. Yet this man not only did not know how to calibrate a constant level valve, he didn't even know what was meant by a cubic centimeter graduate.

Receiving little or no information from his service manager, the next place a service man would probably turn would be to the better type of books, published on oilburner service, but if he did he would most certainly draw a blank. In checking the three most popular books written on oilburner service he would find that the author of book number one prefers gun type burners and therefore the entire book is devoted to gun type burners. Book number two devotes five pages to three different types of vaporizing burners . . . two pages of pictures of different parts of the units and three pages of written material describing the units. Book number three devotes approximately one page of written material on vaporizing burners. Under service hints in this book item one says — "Try and sell the customer the latest type burner."

Many vaporizing manufacturers were more interested in volume than they were in good installation and service. That most service organizations don't know vaporizing service is a reflection on the field engineering service rendered by most manufacturers.

One manufacturer's field engineer spent six weeks in Philadelphia checking complaint installations. What his recommendations were, I don't know, but I do know that the following year, when our organization took over this manufacturer's authorized service for this area, these complaint conditions were still in existence. Reading our service men's reports made us marvel that the units operated at all. Furnaces were not level, oil tanks were too low, oil flow rates were everywhere but where they should have been, draft adjusters were improperly set, and as a climax, we found two complete building operations, totaling over one hundred and fifty houses, in which every furnace was improperly wired. With the sequence of operation peculiar to this manufacturer's equipment, this bad wiring made it absolutely impossible for these units to operate properly, yet their field engineer missed it completely, as had the service department of their previous local representative who had originally installed these furnaces and had serviced

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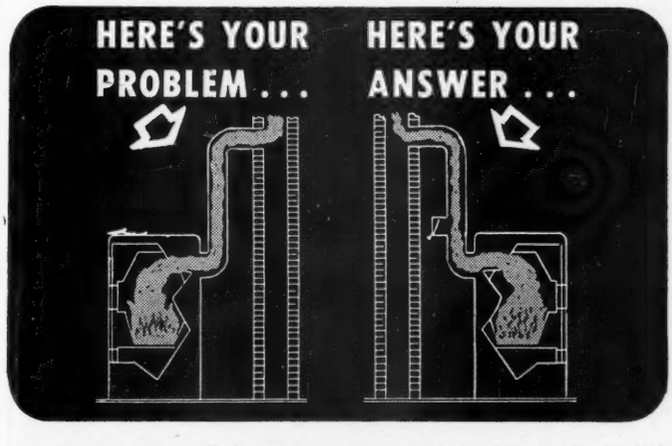

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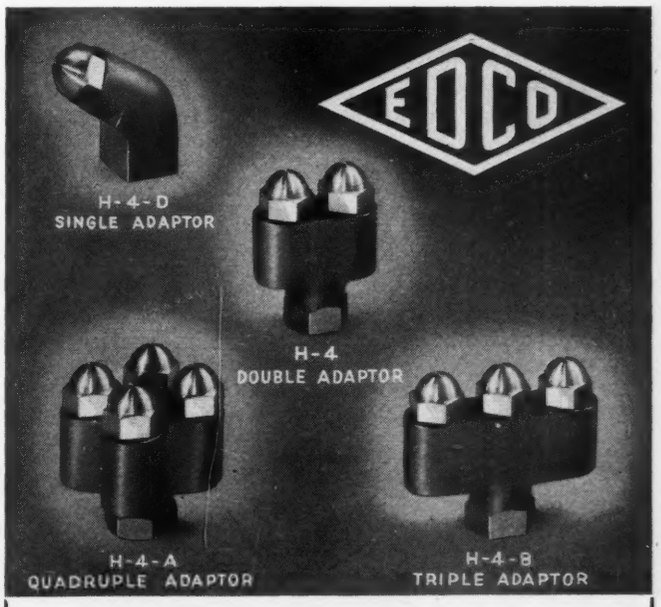

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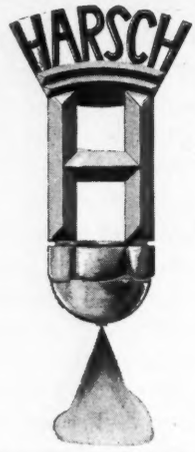

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them for three years. One of our service men located this trouble on the first unit he worked on.

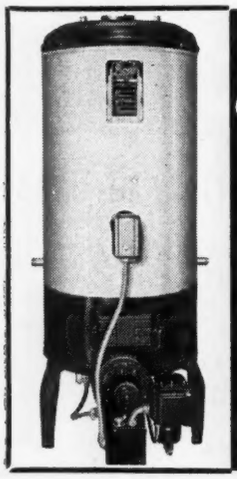
While some manufacturers did render excellent field service which is, of course, reflected in the operation of their equipment, nevertheless they have to suffer along with those quilty of poor service. Public condemnation is usually by type rather than by specific names. Just as people have said in the past, "don't buy an electric refrigerator," without mentioning the name of the manufacturer with which they had their unhappy experience, so today are people saying, "don't buy a vaporizing oilburner." Worse yet for our industry are those disguested vaporizing burner owners who merely say, "don't buy an oilburner."

No vaporizing burner service program can hope to be successful without the full cooperation of the fueloil companies who deliver millions of gallons of oil to these burners every year, and yet who through negligence or carelessness, have failed to realize their responsibilities in the proper operation of these units. Oil companies will tell you that these units should burn only the lighter grades of oil which are not available in sufficient quantities because of war demands. This is of course the truth, but what is more important today, is that they keep the oil delivered to each customer somewhere near the specifications of the oil with which the customer starts the year. Grades of oil cannot be switched after the start of the heating season without serious service repercussions. If a switch to a heavy grade of oil is made after the unit has been calibrated for a light grade of oil, those units burning a pilot fire on the bottom of the pot will go out, necessitating a service call to recalibrate and start up. On units which burn an elevated low fire off the lower baffle it is far more serious. The low fire will drop down on the bottom of the pot where it might smolder and smoke for weeks before going out, which of course means a vacuum cleanout of the unit in addition to recalibration and starting up.

If a switch from a heavy grade to a light grade is made, the fires of course will become too high with similar repercussions. Nothing is more discouraging to a conscientious service man than to calibrate a unit perfectly, and then go back a month or two later and find the flow rate on the unit radically changed from where he set it. He usually reports that the constant level valve is incapable of maintaining a setting, not realizing that a switch has been made in the grade of oil by the oil company.

Oil companies should analyze their supply situation for the coming year and decide to deliver No. 1 oil only to the number of accounts they know they can supply for the entire year. To the balance, deliver medium oil, but deliver it for the entire year without switching.

What we are vitally interested in right now is cutting service calls on these burners to a minimum. We can compensate to a great extent for the heavy grades of oil in our calibration of these units, but as constant level valves are not viscosity valves, there is no way to compensate for oils of varied viscosities. Our organization follows this policy and, while we deliver No. 1 fueloil to less than twenty-five per cent of our vaporizing accounts, we still hold our service calls down to



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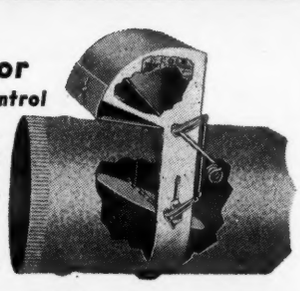

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considerably less than an average of two calls per unit per year.

When supply of fueloil becomes normal, postwar, fueloil companies should study the specifications of domestic oils, paying particular attention to carbon residue and end point, and govern themselves accordingly where vaporizing burners are concerned, regardless of the Underwriters labels, which merely mean that a unit can handle an oil safely, and not necessarily efficiently.

It can be seen that most of us stand indicted for some share of responsibility in the operation of this equipment. As far as a service training program is concerned, this is decidely a case of where united we stand, divided we fail. If each of us is willing to accept our share of responsibility, all we then need will be cooperation. From manufacturers, information and still more information. From dealers, thorough service training programs. From service men, honest attempts at proper service. And from the fueloil companies, cooperation in grading the oil delivered. Otherwise, we can go along as in the past, passing the buck, with manufacturers blaming conditions on bad oil, the oil companies on bad service, and service men and service organizations on bad equipment, but our customers will rightfully place the blame on oil heat.

Ration Amendments

SINCE THE LAST ISSUE only one amendment has been issued to Ration Order No. 11:

Amendment 60

PRESENT REGULATIONS

The present regulations provide that only "necessary living and sleeping quarters" may be included in the floor area for the purpose of figuring a heating ration for certain residential premises.

CHANGE AND REASON FOR CHANGE

The quoted phrase has been interpreted as a test for the applicant's eligibility for a ration. Thus, whether the premises had any "necessary living and sleeping quarters" depended upon whether it was necessary for the occupant to live in the premises. This was a question of fact for the determination of the Boards. As a result some Boards, for example, denied applications for rations for summer homes upon the ground that the occupancy was unnecessary while other Boards, upon similar facts, granted the applications. In order to achieve uniformity, Sections 1394.5363 (b), 1394.5424 (b) and paragraph 5 (b) of Appendix A are being amended so that the phrase "necessary living and sleeping quarters" limits not the applicant's eligibility for a ration but only the space that may be counted in computing the ration.

PIWC Plans Education On Oil's War Activities

A FUND OF $300,000 has been appropriated by the Petroleum Industry War Council for a public relations program in cooperation with the Petroleum Administration for War to publicize the war accomplishments of the petroleum industry. A committee has been formed to carry on the program under the chairmanship of B. I. Graves of Tidewater.

PREFERRED

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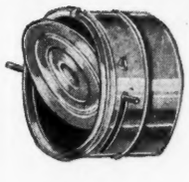

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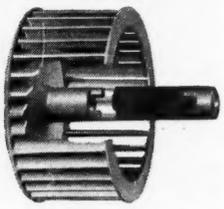

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Pick Radiation

(*Continued from page 43*)

located adjacent to the walls in positions B or C. Normally, high temperatures at the ceiling have little bearing upon the comfort of occupants, but they do result in higher heat losses from the house, particularly in the case of rooms having ceilings exposed to the outdoors or to unheated attic spaces.

The temperature gradients shown in Fig. 4 were obtained for days when the average outdoor temperature was approximately 30 deg. F. For colder weather the gradients were steeper and the differences in the temperatures produced by the various installations were accentuated. At an outdoor temperature of 15 deg. F. the air temperatures at the floor were approximately 1 deg. F. lower and the temperatures at the ceiling were from 1 to 1½ deg. F. higher than those shown.

From the consideration of temperature gradients alone, it appeared that just as good operating results were obtained with a radiator located along an inside wall as were obtained with one located in any other position except under a window. However, since both dry-bulb temperature and air motion are factors influencing comfort conditions, the use of air temperature gradiants alone as a basis for comparing the performance of different radiator installations in a given room may be misleading. Figure 5 shows the results of smoke studies made in the living room to determine the amount and direction of the air movement resulting from the use of each of the five radiator installations. These diagrams show the locations in which high or critical air velocities occurred, and the numbers indicate the magnitudes of the velocities in ft. per min.

When the radiators were located at A or B, along the exposed wall, cool air from the vestibule and stairway entered the room and the main current moved in a large arc through the middle of the room towards the unexposed wall and archway between the living room and dining room. The maximum velocity was approximately 25 ft. per min. When the two radiators were located in the positions shown as A, up currents of heated air from the radiators intercepted any down currents of cold air from the windows and thus prevented cold drafts across the floor. At the same time the cool air coming down over the windows mixed with the heated air rising from the radiators and thus lowered the temperature of the air traveling towards the ceiling. As a result, the temperature of the air at the ceiling was moderated. Since even in very cold weather, the temperature of the inside surface of exposed walls was only about 3 deg. F. lower than that of the air in the room there was no flow of cold air down these walls and across the floor.

When the two small radiators, located under the windows at A, were replaced by a single radiator located between the windows at B, the air currents across the floor of the room remained practically the same, except for a slight movement of cool air from the windows toward the center of the room. The greater part of the cool air from the windows, however, was drawn directly into the radiator. In the absence of a window or other cold surface above the radiator the heated air rose to the ceiling, resulting in the comparatively high temperature shown in Fig. 4. It

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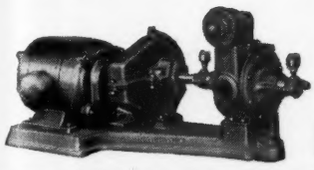

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then settled uniformly throughout the room. No objectionable drafts were observed at any time during the operation of the heating system with the radiators located at either A or B, along the exposed wall.

A marked increase in the movement of air over the floor was observed as soon as the radiator was placed along the inside wall at position C. In this case the main air current originating in the vestibule and at the stairway was augmented by cold air from the windows and exposed walls. Air velocities across the floor as high as 35 ft. per min. were observed. Under these conditions, cold drafts were noticeable around the ankles and the room was less comfortable than it was when the radiators were located along the exposed wall, in spite of the fact that the temperature of the air at the floor remained unchanged at 69 deg. F.

Increasing the velocity of 69 deg. F. air from 20 ft. per min. to 35 ft. per min. has the same effect on comfort as reducing the temperature of the air moving at the rate of 20 ft. per min. from 69 deg. F. to 67.5 deg. F. Such a change is of sufficient magnitude as to be distinctly noticeable, particularly when occurring near the lower limit of comfort.

In conclusion, it may be stated that in order to get the best performance from a heating system from the standpoints of efficiency and comfort, these rules should be observed in making the design calculations and in the selection of the radiation.

1. Make the heat loss calculations for each room of the house accurately. The procedures outlined in the ASHVE Guide or a simplification of this procedure, such as the one included in the I-B-R Installation Guides, should be used.

2. Under normal conditions, select the radiation for each room on the basis of the heat loss calculations.

3. Locate radiators along exposed walls. They should be placed under windows whenever possible.

4. Use long, low radiators because tests have shown that long, low, cast-iron radiators placed under windows heat a room more comfortably and more economically than higher column, or tubular, radiators similarly placed.

Producers' Council Seeks Lower Construction Costs

AN ELEVEN-POINT program designed to lower the cost of postwar construction and stimulate a maximum volume of building and employment after the war has been adopted by the Advisory Board of the Producers' Council at a meeting held in New York City, according to an announcement by Douglas Whitlock, chairman of the Board.

The program, which was presented by L. C. Hart, Council president, promised strong support to the Construction Industry Advisory Council which is dealing with reconversion problems and developing unified national policies for the building industry.

The volume of new construction, both private and public, is expected to total slightly more than $4 billion during 1945 and should increase to about $5.8 billion next year, provided war production has been substantially reduced by the middle of 1946, according to revised estimates prepared by the Market Analysis Committee of the Producers' Council.

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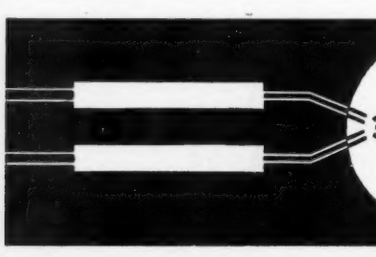

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